Copper Corp (Pty) Limited

Vleifontein Prospecting Project

DRAFT

Basic Assessment Report (BAR) and Environmental Management Programme (EMPr)

Compiled in terms of Appendix 1 and Appendix 4 of the amended Environmental Impact Assessment Regulations, 2014 (Government Notice 982) (EIA Regulations, 2014) and submitted as contemplated in Regulation 19 of Chapter 4 of the EIA Regulations, 2014

For
The application for an Environmental Authorization in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), Amended Environmental Impact Assessment Regulations 2014, Government Notice 983 - Listing Notice 1 of 2014

DMRE Reference No.: NW 30/5/1/1/2/13344 PR

JUNE 2022

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Appendix C	Deed's lists
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Report Type: Draft BAR/EMPr

Project Title: Vleifontein Prospecting Project

Compiled for: Copper Corp (Pty) Limited

Compiled by: E. van Rooyen, BSc. Hons Biodiversity and Conservation Ecology

Reviewed by: T. Shakwane, B.Sc. Hons. Pr. Sci.Nat and Registered EAP

Version: Draft

Date: 24 June 2022

Disclaimer:

The results and conclusions of this report are limited to the Scope of Work agreed between Geovicon Environmental (Pty) Limited and Copper Corp (Pty) Limited for whom this report/ investigation has been conducted. All assumptions made and all information contained within this report and its attachments depend on the accessibility to and reliability of relevant information, including maps, previous reports and laboratory results, from the Client and Contractors. All work conducted by Geovicon Environmental (Pty) Limited is done in accordance with the Geovicon Standard Operating Procedures.

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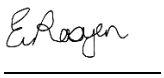
Declaration:

I hereby declare:

1. I have no vested interest (present or prospective) in the project that is the subject of this report as well as its attachments. I have no personal interest with respect to the parties involved in this project.

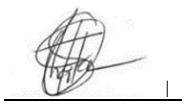
2. I have no bias with regard to this project or towards the various stakeholders involved in this project.

3. I have not received, nor have I been offered, any significant form of inappropriate reward for compiling this report.



(Electronic signature) E. van Rooyen, BSc. Hons, Biodiversity and Conservation Ecology.

This report was reviewed by:



(Electronic Signature) T. Shakwane, B.Sc. Hons. (Professional Natural Scientist no: 117080)

EXECUTIVE SUMMARY

Copper Corp (Pty) Limited has lodged an application for a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2004 (Act 28 of 2004). Copper Corp (Pty) Limited proposes to prospect for copper ore and iron ore, situated within the Magisterial District of Zeerust. Refer to **Appendix A** for the regulation 2(2) plan.

The proposed Vleifontein prospecting project will be undertaken in different phases i.e., literature review (available data interpretation and deciding whether to commence with drilling), field mapping and geophysical survey, positioning of drilling sites, diamond core drilling, logging/sampling of borehole cores and rehabilitation of the drilling site.

The commencement of the proposed Vleifontein prospecting project will result in the undertaking of activities that are considered as listed activities in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) as amended (NEMA). In terms of the above-mentioned legislation, an application for an environmental authorisation must be submitted to the competent authority which application must be granted before the commencement of the proposed listed activities. In addition to the above, an environmental impact assessment must be undertaken in support of the environmental authorisation application for the proposed listed activities. In view of the above, Copper Corp (Pty) Limited appointed Geovicon Environmental (Pty) Limited, an independent environmental consulting company, to undertake and manage the environmental authorisation application and the environmental impact assessment for the proposed Vleifontein prospecting project. An application for an environmental authorisation for the proposed Vleifontein prospecting project was submitted to the Department of Mineral Resources and Energy (DMRE), North West Regional Office (Competent Authority) for their consideration. The application has ever since been received by the Department and a Basic Assessment Report (BAR) together with an EMPr must be compiled and submitted in terms of the requirements of the EIA Regulations, 2014.

This document (BAR and EMPr), which concerns assessment of environmental impacts and a programme for management of the impacts for the proposed activities at the Vleifontein prospecting area, was compiled in terms of the amended EIA Regulations, 2014 for review by interested and affected parties including the competent authority.

Environmental baseline data used in this report has been obtained through desktop assessments for surface water, geohydrological data, topographical analyses, soil surveys, vegetation surveys, wetland surveys and geological conditions and the socio-economic aspects. Weather data was acquired from the website, world weather online. Historic land use was determined through available google satellite image data. The data accumulated and analysed is; therefore, deemed sufficient to gain a baseline indication of the present state of the environment. The use of this baseline data for impact assessments is thus justified, and reliable conclusions could be made. The impacts that could arise during and after the proposed activities at the Vleifontein prospecting area were determined and ranked according to their significance. Based on the impact assessment, recommendations were made for the mitigation of significant negative environmental impacts that will result from the proposed area.

PART A

BASIC ASSESSMENT REPORT

SECTION ONE

INTRODUCTION

1. INTRODUCTION

1.1. WHO IS DEVELOPING THE BAR AND EMPR?

1.1.1. Name and contact details of the EAP who prepared the BAR and EMPR

EAP: Mr. Ornassis Tshepo Shakwane

Professional registration:

SACNASP: 117080

EAPASA: 2019/1763

IAIA Membership No.: 3847

Company: Geovicon Environmental (Pty) Limited

Postal Address:

P.O. Box 4050

MIDDELBURG, 1050

Tel: (013) 243 5842

Fax: (086) 632 4936

Cell No.: 082 498 1847

Email: tshepo@geovicon.co.za

1.1.2. Expertise of the EAP who prepared the BAR and EMPR

Geovicon Environmental (Pty) Limited is a geological and environmental consulting company. The company was formed during 1996, and currently has more than 20 years' experience in the geological and environmental consulting field. Geovicon Environmental (Pty) Limited has successfully completed consulting work in the Mining sector (coal, gold, base metal and diamond), Quarrying sector (sand, aggregate and dimension stone), Industrial sector and housing sector. Geovicon Environmental (Pty) Limited has undertaken contracts within all the provinces of South Africa, Swaziland, Botswana and Zambia. During 2001 Geovicon Environmental (Pty) Limited entered the field of mine environmental management and water monitoring.

Geovicon Environmental (Pty) Limited is a Black Economically Empowered Company with the BEE component owning 60% of the company. Geovicon Environmental (Pty) Limited has three directors i.e., O.T Shakwane, J.M. Bate and T.G Tefu.

Mr. O.T Shakwane obtained his BSc (Microbiology and Biochemistry) from the University of Durban Westville in 1994, and completed his honours degree in Microbiology in 1995. Mr O.T Shakwane has also completed short courses on environmental law and environmental impact assessment with the University of Mpumalanga's Centre for Environmental Management. He has worked with the three state departments tasked with mining and environmental management i.e., Department of Water and Sanitation (Gauteng and Mpumalanga Region), Department of Mineral Resources and Energy (Mpumalanga Region) and Department of Agriculture, Conservation and Environment (Gauteng Region). Mr. Shakwane has been in the consulting field since 2004 and has completed various areas similar to the proposed Vleifontein prospecting project as an environmental assessment practitioner. Mr

Shakwane is the environmental assessment practitioner for the environmental impact assessment for the proposed Vleifontein prospecting project.

Over the past years Geovicon Environmental (Pty) Limited has formalised working relationships with companies that offer expertise in the following fields i.e., Geohydrology, Civil and Geotechnical Engineering, Geotechnical Consultancy, Survey and Mine Planning and Soil & Land Use Consultancy. Geovicon Environmental (Pty) Limited is an independent consulting company, which has no interest in the outcome of the decision regarding the Vleifontein prospecting project basic assessment process.

The curriculum vitae of the EAP is attached as **Appendix B.**

1.2. WHO WILL EVALUATE AND APPROVE THE BAR AND EMPR?

Before the proposed project can proceed, an Environmental Assessment Practitioner (EAP) must compile an application for an environmental authorisation for the proposed project. An impact assessment (basic assessment process) must be undertaken in support of the application for an environmental authorisation. The basic assessment process will determine the potential environmental impacts that may result from the proposed project and an environmental management programme will be compiled to provide measures for mitigation against the identified impacts. The above-mentioned application must be made to the competent authority and in terms of section 24D (1) of NEMA, the Minister responsible for mineral resources is the responsible competent authority for this application. In view of the above, the application for the environmental authorisation for the proposed project was submitted to the Department of Mineral Resources and Energy (DMRE), North West Regional Office for their consideration and decision making.

In the spirit of co-operative governance and in compliance with the requirements of NEMA and the MPRDA, the competent authority may, during the processing for the environmental authorisation application, consult with other organs of state that administers laws that relate to matters affecting the environment relevant to this application. Note that during the public participation process for the proposed project, the EAP will also consult with the below listed state authorities.

The organs of state that are to be consulted may include the following:

- Department of Mineral Resources and Energy, North West Regional Office (Competent Authority)
- South African Heritage Resources Agency
- Department of Water and Sanitation.

Note however that this list is not exhaustive as more organs of state may be identified by the competent authority and EAP during the public participation process.

1.3. DETAILS OF THE APPLICANT

1.3.1. Name of the Applicant

Copper Corp (Pty) Limited

1.3.2. Name of the Project

Vleifontein prospecting project

1.3.3. Postal Address of Applicant

Copper Corp (Pty) Limited

P.O. Box 213

Waterkloof

Pretoria

0181

1.3.4. Responsible Person

Mongwe Mojalefa

1.3.5. Contact Person

Mongwe Mojalefa

Cell No: 0745489726

Fax: (086) 5751718

E-mail: douglas@xakwa.com

1.4. DESCRIPTION OF THE PROPERTY (LOCATION OF THE PROJECT)

1.4.1. Regional Setting

The Vleifontein prospecting project is situated within the Zeerust magisterial District approximately 80 km north east of Zeerust, access to the area is via the R49 provincial road that passes through the proposed Vleifontein prospecting area. See Table 1 for the distance and directions of towns around the Vleifontein prospecting area and Figure 1 for the location of Vleifontein prospecting area.

1.4.2. Farm Name of the prospecting Area

The proposed Vleifontein prospecting area is situated on portions 1 and the Remaining Extent of the farm Vleifontein 105 KP, Remaining Extent of the farm Lekkerdorst 104 KP, a portion of portion 1 and a portion of the Remaining Extent of the farm Abjaterskop 940 KP and portion 1 of the farm Abjaterskop 929 KP (Previously known as portions 1,2,3,4,6 and the Remaining Extent of the farm Abjaterskop 107 KP), situated within the Zeerust Magisterial District.

1.4.3. Magisterial District & Regional Services Council

- Magisterial District: Zeerust Magisterial District, North West
- District Municipality: Ngaka Modiri Molema District Municipality
- Local Municipality: Romotshere Moiloa

1.4.4. Direction and Distance to Nearest Towns

Table 1: Direction and Distance to the nearest towns from the proposed prospecting area.

TOWN (Surrounding nearest towns from the proposed area)	DIRECTION	Distance (km) from the Surrounding towns
Supingstad	North West	5 km
Zeerust	South	83 km
Groot Marico	South East	90km
Thabazimbi	East	122km

1.4.1. Locality Plan

Refer to Figure 1 for the locality plan of the Vleifontein prospecting area.

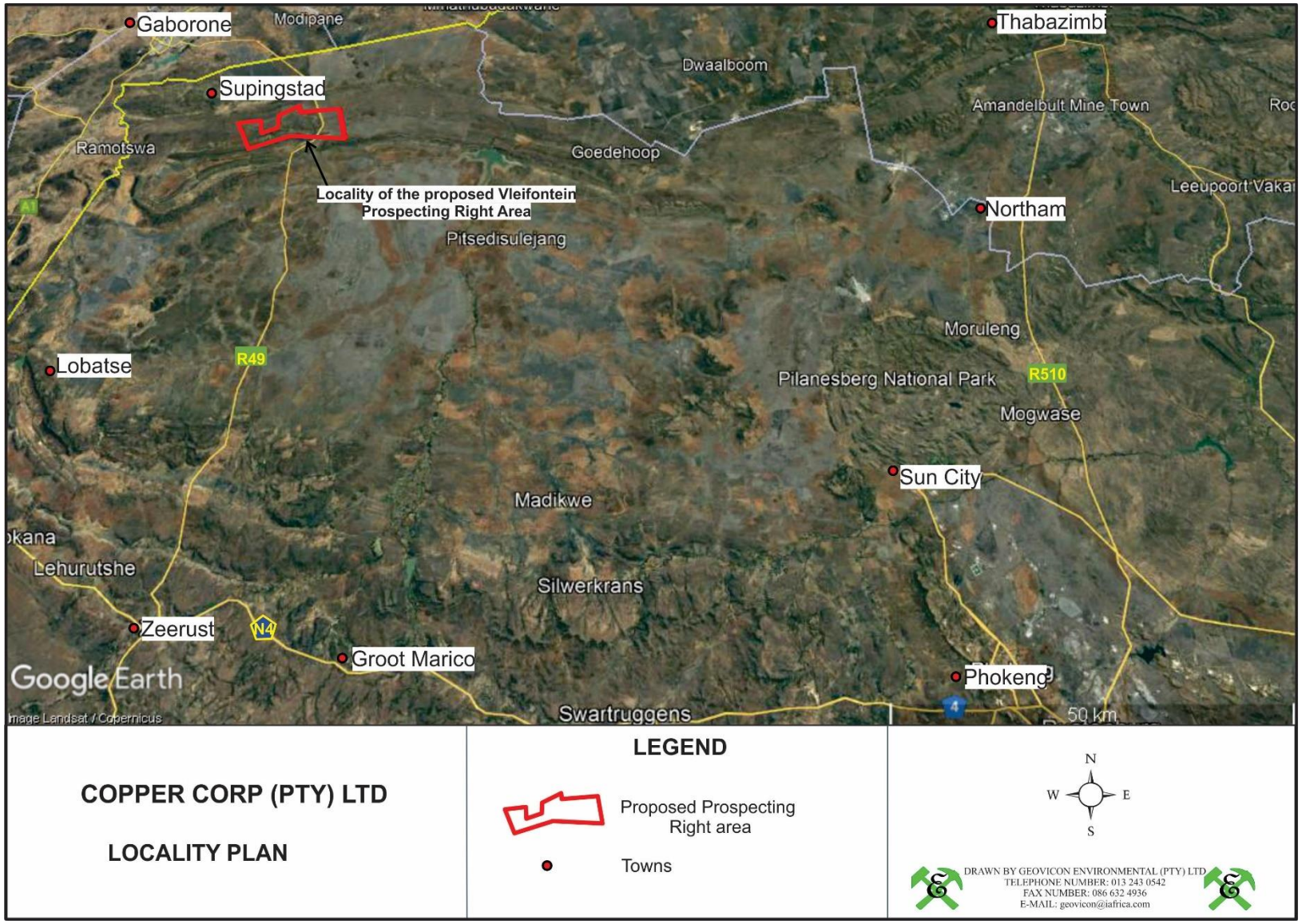


Figure 1: Locality Plan.

1.4.2. Land Tenure and Use of Immediate and Adjacent Land

Land tenure for the properties within and immediately around the proposed Vleifontein prospecting area is indicated on Table 2, as well as Figure 2 and Figure 3 below. Figure 2 below provides a visual indication of the direct farms and surface owners, whereas Figure 3 below provides a visual indication of the immediately adjacent farms and surface owners.

Table 2: Schedule of properties listing surface ownership within and surrounding Vleifontein prospecting area.

FARM NAME AND NUMBER	21 DIGIT SURVEYOR GENERAL CODE	DESCRIPTION OF SUB-DIVISION	SURFACE OWNER
DIRECT SURFACE OWNERS			
LEKKERDORST 104 KP	T0KP00000000010400000	**Remaining Extent**	National Government of the Republic of South Africa
VLEIFONTEIN 105 KP	T0KP00000000010500000	**Remaining Extent**	Borobalo Bed & Breakfast cc
	T0KP00000000010500001	**Portion 1**	Republic of Bophuthatswana
ABJATERSKOP 929 KP	T0KP00000000092900001	**Portion 1**	Madikwe Nature Reserve
ABJATERSKOP 940 KP	T0KP00000000094000000	**Portion of Remaining Extent**	HENTIQ 2065 (Pty) Ltd
	T0KP00000000094000001	**Portion of Portion 1**	SANRAL
ADJACENT SURFACE OWNERS			
MOOIFONTEIN 97 KP	T0KP00000000009700001	**Portion 1**	Provincial Government of North West Province
WONDERBOOM 98 KP	T0KP00000000009800002	**Portion 2**	National Government of the Republic of South Africa
	T0KP00000000009800005	**Portion 5**	National Government of the Republic of South Africa
	T0KP00000000009800007	**Portion 7**	SANRAL
SLALAAGTE 100 KP	T0KP00000000010000000	**Remaining Extent**	National Government of the Republic of South Africa
	T0KP00000000010000001	**Portion 1**	National Government of the Republic of South Africa
VINKRIVIER 101 KP	T0KP00000000010100000	**Remaining Extent**	Republic of Bophuthatswana

FARM NAME AND NUMBER	21 DIGIT SURVEYOR GENERAL CODE	DESCRIPTION OF SUB-DIVISION	SURFACE OWNER
HARTEBEESTFONTEIN 102 KP	T0KP00000000010200003	**Portion 3**	Republic of Bophuthatswana
SEBENANI 103 KP	T0KP00000000010300000	**Remaining Extent**	Republic of Bophuthatswana
VLEIFONTEIN 105 KP	T0KP00000000010500002	**Portion 2**	Republic of Bophuthatswana
UITVAL 106 KP	T0KP00000000010600001	**Portion 1**	National Government of the Republic of South Africa
BOSCHRAND 109 KP	T0KP00000000010900001	**Portion 1**	National Government of the Republic of South Africa
	T0KP00000000010900003	**Portion 3**	Provincial Government of North West Province
BRANDWACHT 118 KP	T0KP00000000011800001	**Portion 1**	Provincial Government of North West Province
DROOGEDAL 120 KP	T0KP00000000012000000	**Remaining Extent**	National Government of the Republic of South Africa
	T0KP00000000012000001	**Portion 1**	Kokame Communal Property Association
	T0KP00000000012000002	**Portion 2**	Malebelele Communal Property Association
	T0KP00000000012000004	**Portion 4**	National Government of the Republic of South Africa
	T0KP00000000012000007	**Portion 7**	Malebelele Communal Property Association
	T0KP00000000012000020	**Portion 20**	SANRAL
HEIWEHBERG 121 KP	T0KP00000000012100000	**Remaining Extent**	Malebelele Communal Property Association
MIDDELRAND 122 KP	T0KP00000000012200000	**Remaining Extent**	National Government of the Republic of South Africa
OPHIR 133 KP	T0KP00000000013300001	**Portion 1**	National Government of the Republic of South Africa
	T0KP00000000013300003	**Portion 3**	National Government of the Republic of South Africa

FARM NAME AND NUMBER	21 DIGIT SURVEYOR GENERAL CODE	DESCRIPTION OF SUB-DIVISION	SURFACE OWNER
ABJATERSKOP 940 KP	T0KP00000000094000000	**Portion of Remaining Extent**	HENTIQ 2065 (Pty) Ltd

***Portions** on which the prospecting area is applied for, also refer to **Appendix C** Deed's list of direct farm owners.

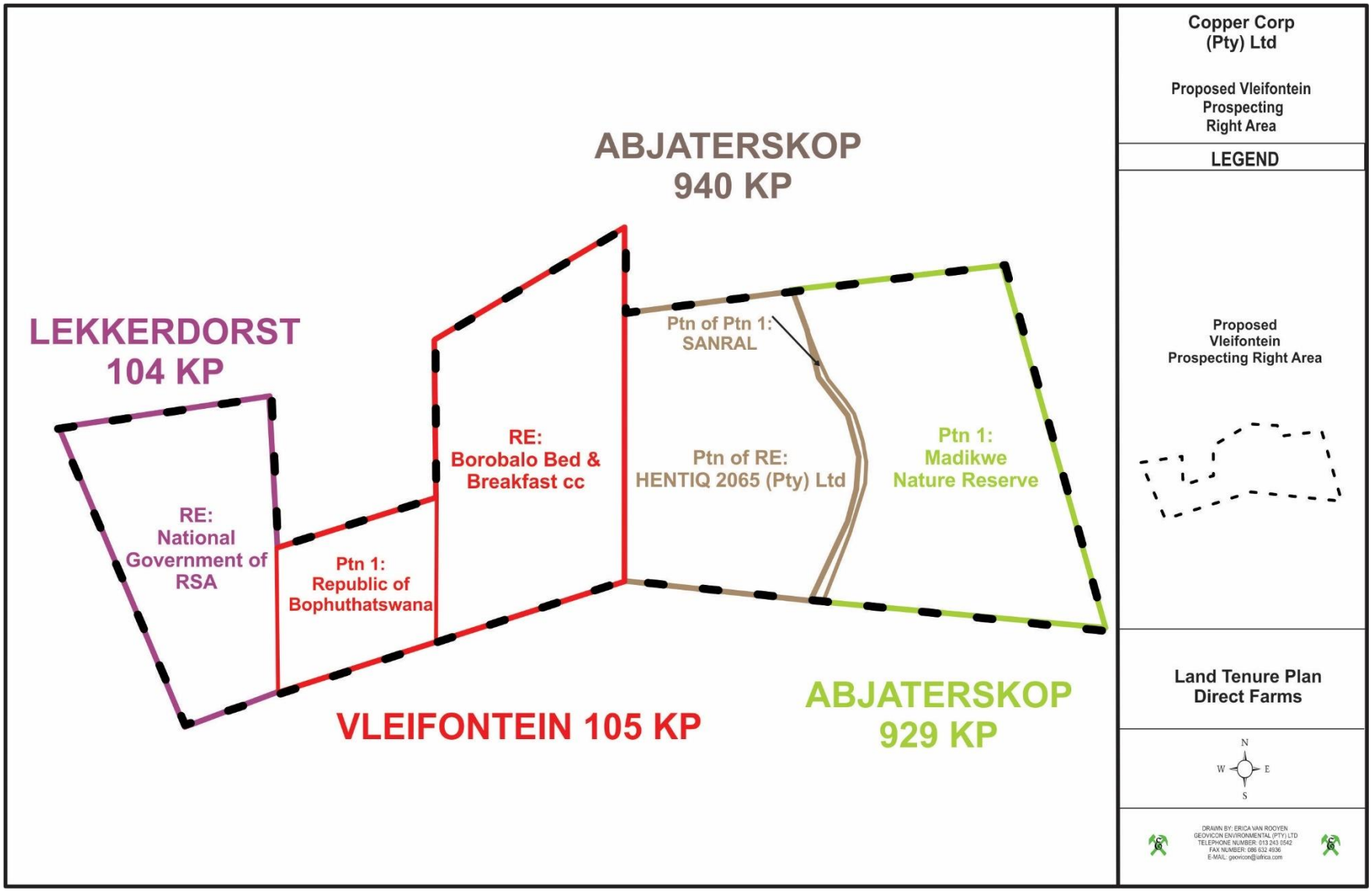


Figure 2: Land Tenure Plan for the direct farms of the proposed Vleifontein prospecting right area.

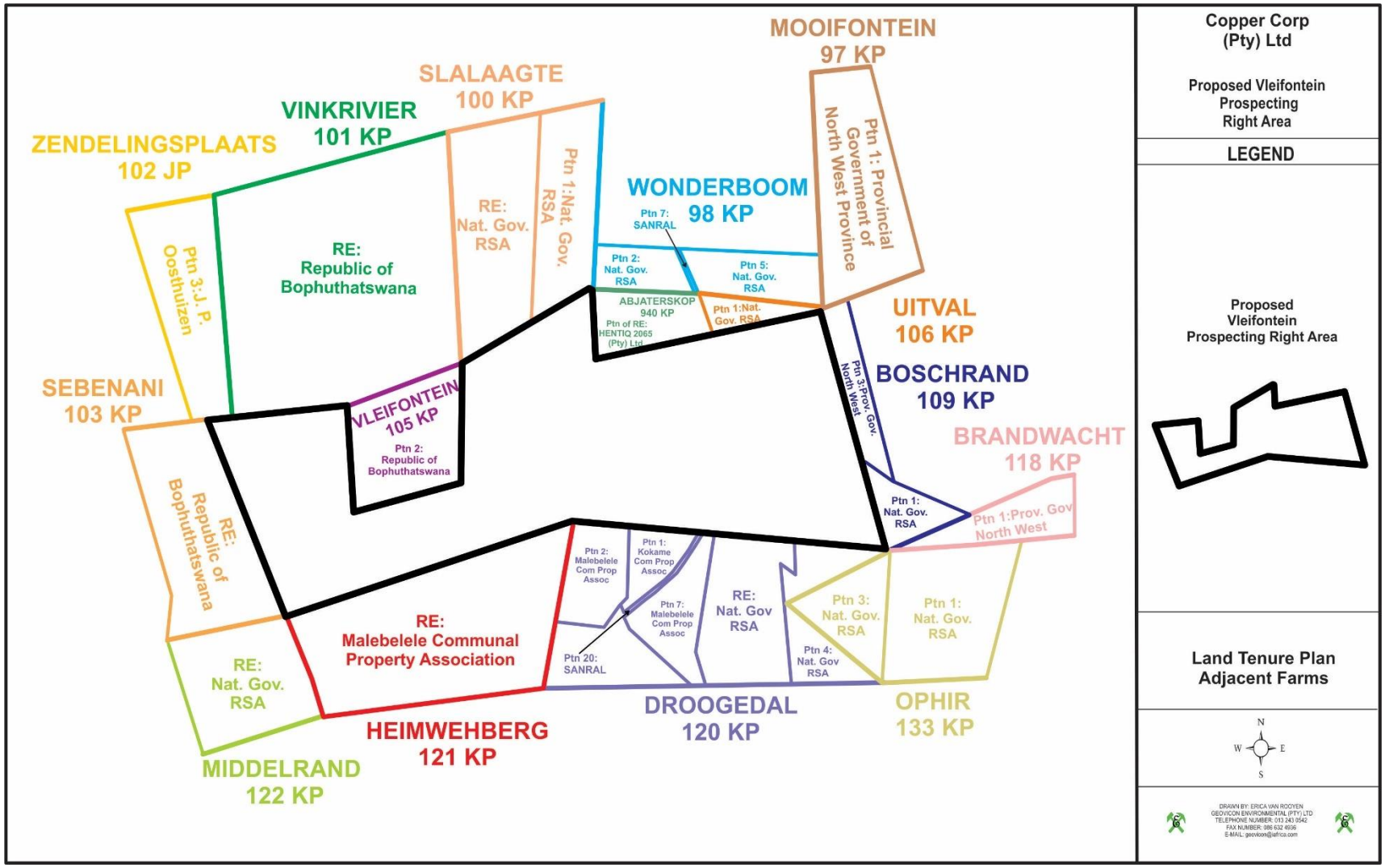


Figure 3: Land Tenure Plan for the adjacent farms of the proposed Vleifontein prospecting right area

SECTION TWO

DESCRIPTION OF THE SCOPE OF THE PROPOSED PROJECT

2. DESCRIPTION OF THE SCOPE OF THE PROPOSED PROJECT

2.1. LISTED ACTIVITIES AND SPECIFIED ACTIVITIES

In terms of the NEMA, the proposed Vleifontein prospecting project will result in activities that are considered as listed activities. In terms of the above-mentioned legislation, none of the above-mentioned listed activities can be conducted without an environmental authorisation. In view of the above, Copper Corp (Pty) Limited has applied for an environmental authorisation for all listed activities to be conducted at the proposed Vleifontein prospecting area to the competent authority (DMRE). This section will give a description of the listed activities that will be included in the application for an environmental authorisation. Table 3 is compiled as prescribed by the DMRE, EIR and EMPr template and reflects all project activities applied for.

2.2. DESCRIPTION OF THE PROPOSED PROJECT

Copper Corp (Pty) Limited proposes to prospect for copper ore and iron ore over the proposed Vleifontein prospecting right area. This activity will be undertaken on portions 1 and the Remaining Extent of the farm Vleifontein 105 KP, Remaining Extent of the farm Lekkerdorst 104 KP, a portion of portion 1 and a portion of the Remaining Extent of the farm Abjaterskop 940 KP and portion 1 of the farm Abjaterskop 929 KP (Previously known as portions 1,2,3,4,6 and the Remaining Extent of the farm Abjaterskop 107 KP) situated within the Zeerust Magisterial District.

Table 3: Proposed Vleifontein prospecting area Listed Activities.

LISTED ACTIVITY	NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY	APPLICABLE LISTING NOTICE
PROPOSED VLEIFONTEIN PROSPECTING AREA LISTED AND SPECIFIC ACTIVITIES			
NATIONAL ENVIRONMENTAL MANAGEMENT ACT			
Activity 20 of Listing Notice 1: Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	Conducting prospecting activities within the Vleifontein prospecting area for minerals applied for These include site establishment (access to site and a campsite), pegging of drilling sites, drilling of exploration boreholes, logging and sampling of drilled cores and site rehabilitation.	7432,64 ha	GN983

2.2.1. Target Minerals

Copper ore and Iron ore.

2.2.2. Prospecting method to be used at the Vleifontein prospecting area.

The proposed Vleifontein prospecting area will be explored in different phases i.e., literature review, field mapping and drilling of boreholes. Only the field mapping and drilling phases have potential for environmental impacts, thus only these two last phases will be described in this section of the report.

The literature review will help in bringing clarity, focus and broaden the knowledge to the area of which prospecting right has been applied for.

Geologic field maps are tools portraying interpretive, three-dimensional views of rock, sediment, and soil units that depict their distribution and age relationships. They provide information on Earth's structure and other features at and below Earth's surface and offer baseline data for mineral and energy resources.

Drilling phase will involve the drilling of the sited boreholes by diamond core drilling machine. A sump will be constructed at each drilling site, for the storage and recycling of water for the cooling of the drill rods during the drilling operation. The sump will be constructed to be one square meter in size and have a maximum depth of 1 meter. Any soils removed from the sump (approximately one cubic meters) will be placed adjacent to the drilling site and used for rehabilitation of the site.

Boreholes will be drilled at pre-planned sites. The boreholes will be drilled to intersect all the expected reserves and will be logged by a geologist. The samples will be sent to a laboratory for quality determination. This data will form the basis for the geological modelling and financial evaluation.

Copper Corp (Pty) Limited proposes to drill 42 boreholes in total throughout the life of the prospecting project.

2.2.3. Planned Life of Project

The current estimated life of the proposed Vleifontein prospecting project is five (5) years.

2.3. VLEIFONTEIN PROSPECTING AREA SURFACE INFRASTRUCTURE DESCRIPTION

2.3.1. Access

There is a good network of both tarred and gravel roads connecting the prospecting area with surrounding towns. Existing roads to be used for the proposed area include the R49 provincial road that passes through the proposed Vleifontein prospecting area, and number private farm roads. Where no roads exist, tracks will be used to access the drilling sites. No clearing of natural vegetation will be undertaken.

2.3.2. Power Supply

Diesel powered vehicles and machinery will be used for the proposed project.

2.3.3. Water Supply

Water will be required at the proposed project area for the purpose of process water and potable water. Process water will be required for cooling of the drill rigs and potable water supply will be required for domestic water use within the campsite (caravans) and drilling sites. A water tank will be used for the storage of water at the proposed prospecting area.

2.3.4. Workshops and Buildings

No workshops and office buildings will be required for this project. All machinery will be maintained at an offsite workshop. Should emergency repairs be required the repairs will be conducted on site on areas covered with tarpaulins.

2.3.5. Waste Management

2.3.5.1. Waste Identification and Management

Hazardous Waste

Hazardous waste to be generated includes hydrocarbon wastes (oil and liquid fuel wastes) and sewage waste. Oil waste and liquid fuels waste include used oils from machinery and vehicles and diesel/petrol waste.

General Waste

General waste to be generated from the proposed area is domestic waste. Domestic waste will include papers, containers, food waste, stationary and discarded PPE generated from the drilling and campsites.

2.3.5.2. Waste Management Facilities

Hazardous Waste

Hydrocarbon waste will be collected in drums for storage. The removal of the drums or any other appropriate receptacle will be undertaken by a waste disposal company, for disposal at a registered licensed waste disposal site. The drums will be placed on protected ground.

Chemical toilets will be used for the management of sewage waste generated on site.

General Waste

General waste will be collected in wheeled bins or refuse bags. The removal of this waste will be undertaken by the municipality or disposed at a registered landfill site.

2.4. VLEIFONTEIN PROSPECTING PROJECT- METHOD STATEMENT

In terms of the DMRE BAR and EMPr template, Copper Corp (Pty) Limited must describe the methods and technology to be employed for the proposed project. In view of the above, a method statement for each phase of the proposed project has been provided. This identifies all actions, activities or processes associated with the proposed prospecting operation.

2.4.1. Phase One

2.4.1.1. Data gathering

Relevant information regarding the potential of the identified prospecting area will be sourced from institutions like the Council for Geoscience. This information will be analysed and interpreted through computer modelling of existing data.

The interpretation of the said data will result in compilation of a literature review report. The said report will give indication as to what processes (in order of priority) to follow to complete the prospecting activities.

2.4.1.2. Field Mapping

Geologic field maps are tools portraying interpretive, three-dimensional views of rock, sediment, and soil units that depict their distribution and age relationships. They provide information on Earth's structure and other features at and below Earth's surface and offer baseline data for mineral and energy resources.

2.4.1.3. Detailed site survey and investigation

Demarcation of sensitive and protected areas will be conducted by physical survey of the proposed area by a suitability qualified person. This should be done before establishment of access to the site and drilling of exploration boreholes.

2.4.1.4. Geophysical surveys and data interpretation

A Handheld proton Magnetometer will be used to perform the magnetic survey over the proposed prospecting site. Please refer to Figure 4 below.

Figure 4: GSM-19T Proton Precession system in action.

2.4.1.5 Pegging of drill sites

All exploration borehole sites will be staked by a suitably qualified person. The sites will; thereafter be plotted on a plan drawn to an appropriate scale.

2.4.1.6 Decision to commence with prospecting activities

Once all factors are gathered, a physical inspection of the terrain will be conducted to verify certain aspects, such as, type of the terrain involved, type of methods to be used, etc. The important point to note is that a decision on whether or not to proceed with prospecting depends not only on the scientific and reliability of the methods under consideration, but also upon many fewer tangible factors, such as restrictions that might be imposed by the relevant Department when granting a prospecting right.

2.4.2. Phase Two

2.4.2.1. Diamond core drilling and sump construction

Geological boreholes will be drilled on a predetermined grid. During drilling of each borehole, a sump of approximately 1.0 x 1.0 x 1.0 m will be excavated for storage and reusing of water for the cooling of drill rod during drilling operation. Refer to Figure 5 below, a typical drill rig.

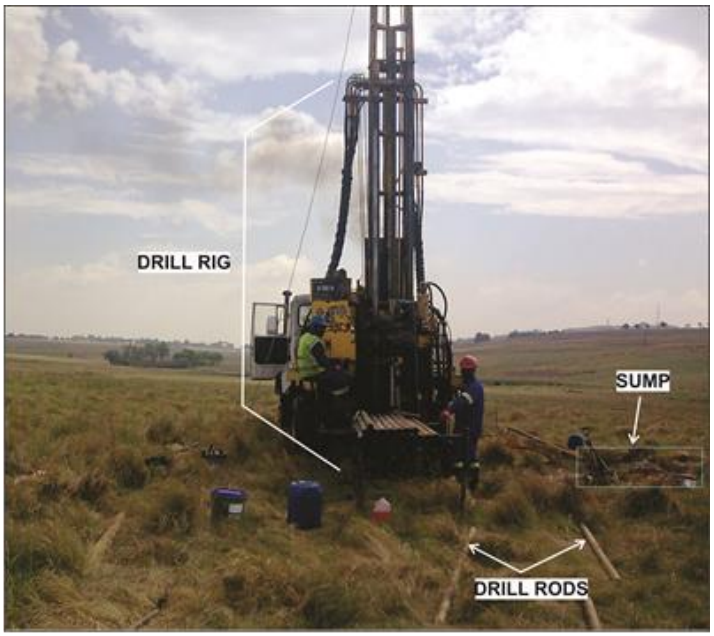


Figure 5: Drill rig operation

2.4.2.2. Topsoil storage site

The top and sub soils removed from the sump and drilling boreholes will be stockpiled in close proximity to the sump. The sumps will be backfilled manually by spade, once drilling and sampling of boreholes is completed.

2.4.2.3. Logging and sampling of the Core

This involves the physical description of the rocks intersected by the drilling process. The interpretation of these rock descriptions will assist in establishing the general stratigraphy of the area. Sampling will be taken at the desired horizons and samples sent to the laboratory for analyses.

2.4.2.4. Site Rehabilitation

Concurrent rehabilitation (Plugging and reseeding) of disturbed areas will be undertaken as drilling progresses.
Please note that the final borehole layout can only be determined once the Prospecting Right is granted; thereafter, it will be sent in to the Department of Mineral Resources and Energy (DMRE).

2.4.3. Decommissioning phase

2.4.4.1. Final Rehabilitation

The sumps will be rehabilitated in such a manner to return the area to as close as possible to its pre-drilling environment.
Post closure, the prospecting area will consist of re-vegetated areas with vegetation cover comparable to the surrounding areas. No prospecting related infrastructure will remain on the prospecting site. The area will conform to the pre-prospecting topography. The areas affected by prospecting will be stable and erosion free.

2.4.4. Pre-feasibility study

This involves the compilation of a final geological report, reserve determination and pre-feasibility studies.

2.4.5. Mining feasibility study

This involves the conducting of a mining feasibility study, market research, sales agreements etc.

2.4.6. After Closure Phase

The rehabilitated area will be monitored on a quarterly basis to ensure that the site returns to an acceptable state, in the event that is not happening naturally, the area will be seeded. After the decommissioning of the site and if it can be determined that the site is stable, an environmental authorisation for the decommissioning of the site and a closure certificate will be applied for in terms of the relevant laws.

SECTION THREE

POLICY AND LEGISLATIVE CONTEXT

3. POLICY AND LEGISLATIVE CONTEXT

3.1. CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA (ACT NO. 108 OF 1996)

Section 24 of the Constitution of the Republic of South Africa (Act No.108 of 1996) states that everyone has the right:

a) to an environment that is not harmful to their health or well-being; and

b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that;

(i) prevent pollution and ecological degradation;

(ii) promote conservation; and

(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

In terms of Section 24 of the Constitution of the Republic of South Africa (Act No.108 of 1996), everyone has the right to an environment that is not harmful to their health or well-being. In addition, people have the right to have the environment protected, for the benefit of present and future generations, through applicable legislations and other measures that prevent pollution, ecological degradation and promote conservation and secure ecological sustainable development through the use of natural resources while prompting justifiable economic and social development. The needs of the environment, as well as affected parties, should thus be integrated into the overall project in order to fulfil the requirements of Section 24 of the Constitution. In view of the above, a number of laws pertaining to environmental management were promulgated to give guidance on how the principles set out in section 24 of the Constitution of the Republic of South Africa (Act No.108 of 1996) would be met. Below are laws applicable to the proposed project that were promulgated to ensure that section 24 of the Constitution of the Republic of South Africa (Act No.108 of 1996) is complied with.

3.2. NATIONAL ENVIRONMENTAL MANAGEMENT ACT

Section 24(1) of the NEMA states:

“In order to give effect to the general objectives of integrated environmental management laid down in this Chapter [Chapter 5], the potential consequences for or impacts on the environment of listed activities or specified activities must be considered, investigated, assessed and reported on to the competent authority or the Minister of the Department of Mineral Resources and Energy, as the case may be, except in respect of those activities that may commence without having to obtain an environmental authorisation in terms of this Act.”

In order to regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to environmental impact assessment, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto, Regulations (EIA Regulations, 2014) were promulgated. These Regulations took effect from the 4th of December 2014.

In addition to the above, Section 28 of the NEMA includes a general “Duty of Care” whereby care must be taken to prevent, control and remedy the effect of significant pollution and environmental degradation. This section stipulates the importance to protect the environment from degradation and

pollution irrespective of the operations taking places or activities triggered / not triggered under GN983, GN984 and GN985.

In view of the above, an environmental impact assessment is being undertaken to comply with the requirements of the NEMA and the NEMA EIA Regulations, 2014. The NEMA EIA Regulations of December 2014 determines requirements to be met in order to obtain an environmental authorisation. This report has; therefore, been compiled in compliance with the above regulations.

3.3. NATIONAL ENVIRONMENTAL MANAGEMENT AIR QUALITY ACT

The National Environmental Management: Air Quality Act (Act No.39 of 2004) (NEM: AQA) focuses on reforming the law regulating air quality in South Africa in order to protect the environment through the provision of reasonable measures protecting the environment against air pollution and ecological degradation and securing ecological sustainable development while promoting justifiable economic and social developments. This Act provides national norms and standards regulating air quality management and control by all spheres of government. These include the National Ambient Air Quality Standards (NAAQS) and the National Dust Control Regulations (NDCR). The standards are defined for different air pollutants with different limits based on the toxicity of the pollutants to the environment and humans, number of allowable exceedances and the date of compliance of the specific standard.

On 22 November 2013 the list of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage was published under GN R893 in Governmental Gazette No 37054, in terms of Section 21(1)(b) of the NEM: AQA.

The proposed project will not trigger any of the activities listed under the above-mentioned Regulations; however, Copper Corp (Pty) Limited must ensure that emissions from their activities complies with the standards as set in the above-mentioned regulations.

3.4. THE NATIONAL HERITAGE RESOURCES ACT

The National Heritage Resources Act (Act No. 25 of 1999) (NHRA) focuses on the protection and management of South Africa's heritage resources. The governing authority for this act is the South African Heritage Resources Agency (SAHRA). In terms of the NHRA, historically important features such as graves, trees, archaeology and fossil beds are protected as well as culturally significant symbols, spaces and landscapes. Section 38 of the NHRA stipulates the requirements a developer must undertake prior to development. In terms of Section 38 of the NHRA, SAHRA can call for a Heritage Impact Assessment (HIA) where certain categories of development are proposed.

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon.

The Act also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is deemed adequate, a separate HIA is not required. An assessment of the proposed area will be done during the drilling programme to determine if there are any sites that require protection. Any sites identified will be marked and no drilling will be undertaken in close proximity of such a site.

3.5. NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT (ACT 10 OF 2004) (NEMBA)

The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA) provides for the management and protection of South Africa's biodiversity within the framework established by

NEMA. The Act aims to legally provide for biodiversity conservation, sustainable, equitable access and benefit sharing and provides for the management and control of alien and invasive species to prevent or minimize harm to the environment and indigenous biodiversity. The Act imposes obligations on landowners (state or private) governing alien invasive species as well as regulates the introduction of genetically modified organisms. The Act encourages the eradication of alien species that may harm indigenous ecosystems or habitats. The NEMBA ensures that provision is made by the site developer to remove any aliens which have been introduced to the site or are present on the site.

The NEMBA also provides for listing of threatened or protected ecosystems, in one of four categories: critically endangered, endangered, vulnerable or protected. The purpose of listing protected ecosystems is primarily to conserve sites of exceptionally high conservation value.

The Act supports South Africa's obligations under sanctioned international agreements regulating international trade in specimens of endangered species, and ensures that the utilization of biodiversity is managed in an ecological sustainable way.

The BAR and EMPr has been complied to ensure that all applicable requirements prescribed in the NEMBA are complied with.

3.6. NORTH WEST BIODIVERSITY MANAGEMENT ACT (ACT 4 OF 2016)

To provide for the management and conservation of the North West's biophysical environment and protected areas within the framework of the National Environment Management Act, 1998 (Act No 107 of 1998); to provide for the protection; to provide for the sustainable use of indigenous biological resources; and to provide for matters connected therewith.

The BAR and EMPr has been compiled to ensure that all applicable requirements prescribed in the Act are complied with.

3.7. MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (MPRDA): ACT 28 OF 2002

The Department of Mineral Resources and Energy (DMRE) is responsible for regulating the mining and minerals industry to achieve equitable access to the country's resources and contribute to sustainable development. The Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) requires that an EIA be conducted and that the EMP be drafted for the mitigation of impacts identified during the environmental impact assessment for a prospecting project. During December 2014, the "One Environmental System" was implemented by Government which initiated the streamlining of the licensing processes for mining, environmental authorisations and water use. Under the One Environmental System, The Minister of Mineral Resources, will issue environmental authorisations and waste management licences in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), and the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA), respectively, for mining and related activities. The Minister of Environmental Affairs will be the appeal authority for these authorisations. In view of the above the application for the environmental authorisation for the proposed project was submitted to the Department of Mineral Resources and Energy as the competent authority.

3.8. NATIONAL WATER ACT (NWA): ACT NO. 36 OF 1998

The National Water Act (Act No. 36 of 1998) (NWA) is the primary regulatory legislation, controlling and managing the use of water resources as well as the pollution thereof in South Africa. The NWA recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users. The NWA presents

strategies to facilitate sound management of water resources, provides for the protection of water resources, and regulates use of water by means of Catchment Management Agencies, Water User Associations, Advisory Committees and International Water Management. The National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest. Further, an industry can only be entitled to use water if the use is permissible under the NWA. The enforcing authority on water users is the Department of Water and Sanitation (DWS).

No water use licence application was submitted to the Department of Water and Sanitation for their consideration. However, should the drilling activities be undertaken within 500 meters from the edge of any wetlands and should abstraction be conducted from the dams or streams, an application (general authorisation or water use licence) will be submitted and obtained before commencement of such water use activities. In addition to the above, measures will be undertaken to ensure that requirements in terms of the NWA and the GN 704 are complied with where necessary.

3.9. NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT (ACT NO. 59 OF 2008)

The National Environmental Management: Waste Act (NEMWA) requires that all waste management activities must be licensed. According to Section 44 of the NEMWA, the licensing procedure must be integrated with an EIA process in terms of the NEMA.

The objectives of NEMWA involve the protection of health, wellbeing and the environment. The NEMWA provides measures for the minimisation of natural resource consumption, avoiding and minimising the generation of waste, reducing, recycling and recovering waste, and treating and safely disposing of waste.

Waste management activities are not triggered by the proposed project, hence no application in terms of the NEMWA was submitted to the Department of Mineral Resources and Energy.

3.10. EIA GUIDELINES

A number of national and provincial EIA guidelines were published by different departments. These guidelines are mainly aimed at assisting relevant stakeholders by providing information and guidance and giving recommendations on a number of aspects relating to the environmental impact assessment process. The guidelines can be used by the competent authority, applicant and the EAP during the EIA process. It is therefore important that the EAP and the person compiling a specialist report must have relevant expertise when conducting the environmental impact assessments.

A number of guidelines were consulted during the compilation of this report and these include amongst them the following i.e., Guidelines on the Need and Desirability, Department of Environmental Affairs and Tourism Integrated Environmental Management Guidelines, Department of Water and Sanitation's Best Practice Guidelines and the Western Cape Provincial Department of Environmental Affairs and Development Planning Guidelines on Public Participation.

SECTION FOUR

NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

4. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

4.1. MOTIVATION FOR THE NEED AND DESIRABILITY OF THE PROJECT

In terms of the EIA Regulations the need and desirability of any development must be considered by the relevant competent authority when reviewing an application. The need and desirability must be included in the reports to be submitted during the environmental authorisation application processes.

The section of the BAR and EMPr will indicate the need and desirability for the approval of the Vleifontein prospecting project.

Assessment of the geological information available has determined that the area in question may have copper and iron ore reserves. In order to ascertain the above and determine the nature, location and extent of the above-mentioned mineral within the proposed prospecting area, it will be necessary for prospecting to be undertaken. The prospecting will also determine if there are any features that may have an impact on the economic extraction of the above-mentioned mineral.

The information that will be obtained from the proposed prospecting project will be necessary to determine where the reserves are located, how it can be viably extracted and the economic value of the total reserve within the prospecting area.

Copper Corp (Pty) Limited predicts that substantial benefits from the area (should a viable reserve be found) will accrue to the immediate area, the sub-region and the province of North-West. These benefits must be offset against the costs of the area, including the impacts to land owners.

The potential benefits of the proposed project are:

- Potential reduction in crime because of short-term job creation during construction (providing farm safety and security measures), and also in the long-run as a result of job creation.
- Local growth in the economy of the host community and surrounding areas, and for local businesses including those that supply accommodation, transport etc.
- Economic benefits for contractors and other suppliers of goods and services.
- Economic opportunities and other potential benefits for land owners from compensation for impacts.
- Based on the environmental assessment conducted as described in this report, there are no environmental impacts associated with the proposed area that cannot be mitigated.

SECTION FIVE

MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT

5. MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT

5.1. CONSIDERATION OF ALTERNATIVES

The National Environmental Management Act 107 of 1998, Environmental Impact Assessment Regulations, 2014 requires a BAR and EMPr to identify alternatives for areas applied for. In terms of the above-mentioned regulations an alternative in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to (a) the property on which or location where it is proposed to undertake the activity; (b) the type of activity to be undertaken; (c) the design or layout of the activity;(d) the technology to be used in the activity;(e) the operational aspects of the activity; and (f) the option of not implementing the activity.

Copper Corp (Pty) Limited intends to undertake prospecting activities for copper ore and iron ore portions 1 and the Remaining Extent of the farm Vleifontein 105 KP, Remaining Extent of the farm Lekkerdorst 104 KP, a portion of portion 1 and a portion of the Remaining Extent of the farm Abjaterskop 940 KP and portion 1 of the farm Abjaterskop 929 KP (Previously known as portions 1,2,3,4,6 and the Remaining Extent of the farm Abjaterskop 107 KP), situated within the Zeerust Magisterial District, to determine whether the area consists of copper ore and iron ore and to also determine if the available reserves have economic value.

Therefore, a number of alternatives were considered for the proposed prospecting project. This section of the report will highlight the alternatives considered for the proposed prospecting activities.

5.1.1. Location Alternatives

The location alternative considered for the proposed project include the prospecting sites and associated campsite location and access routes. The location alternatives were selected based on a number of criteria, which include the environmental considerations (how sensitive is the area in terms of soils, wetlands, groundwater, etc.), sensitive receptors (proximity to communities and farmsteads) and the dependency of the area to the required infrastructure.

5.1.2. Prospecting Sites

The prospecting area was selected based on published relevant literature; therefore, no alternatives were considered since the anticipated minerals could be located on portions 1 and the Remaining Extent of the farm Vleifontein 105 KP, Remaining Extent of the farm Lekkerdorst 104 KP, a portion of portion 1 and a portion of the Remaining Extent of the farm Abjaterskop 940 KP and portion 1 of the farm Abjaterskop 929 KP (Previously known as portions 1,2,3,4,6 and the Remaining Extent of the farm Abjaterskop 107 KP).

5.1.3. Access Routes/Transport alternatives

Two alternatives were considered i.e., existing road and a new road. Since the proponent would like to limit their pollution footprint, the existing access road was decided upon.

5.1.4. Campsite Location

Regarding the location of the campsite, three alternatives were considered. These locations included a static campsite close to the prospecting site, mobile caravans and an offsite campsite.

A static campsite close to the prospecting area or mobile caravans are preferred; however, it will depend on the requirement of the landowner. If the landowner does not allow the preferred options an offsite campsite will be used.

5.1.5. Design/ Layout Alternatives

Since no complicated surface infrastructure will be required for this area no design and layout alternatives for the proposed area were determined. The plan depicting all possible drilling sites will be compiled in consultation with the landowner and submitted with the progress to the Department of Mineral Resources and Energy (DMRE).

5.1.6. Technology Alternatives

The minerals applied for are less cumbersome; hence the normal exploration technologies will be used. In view of the above, no technology alternatives were considered for this project.

5.1.7. Input Material Alternatives

No in-put material alternatives were considered for this area.

5.1.8. Exploration Drilling Methods

Drilling is used to determine the depth, thickness and quality of the minerals in question at any point across a prospecting area. Drilling is also used to determine the actual local geology of the area.

Non-Core Drilling Methods

Non-core drilling techniques mostly uses the rotary drilling methods. In this technique, a string of metal rods is rotated axially and a bit at the base of the string is forced downwards, under controlled pressure, breaking up the ground and advancing the depth of the hole. Cuttings are swept away from the bit and lifted to the surface either by means of pumped circulating water or by jets of compressed air.

Logging of the hole drilled by non-core drilling methods is mainly based on the cuttings obtained as the drill progresses. In view for the difficulty and error bound logging, this method of drilling was discarded and may be used only for infill drilling wherever necessary.

Core-Drilling Methods

Core drilling techniques uses diamond drilling methods. In this technique, a hollow cylindrical drill bit impregnated with industrial diamonds is attached to a series of metal drill rods and rotated under controlled downward pressure. A circle of rock is ground away, the cutting removed by water flushing and a cylindrical core remains in the hollow centre of the drill string.

Core drilling is the only satisfactory means of obtaining representative samples of seams at depth for quality determination. In view of the above, the preferred drilling methods is the core drilling technique using the diamond drill.

5.1.8.1. Transportation

There is a good network of both tarred and gravel roads connecting the prospecting area with surrounding towns. Existing roads to be used for the proposed area include the R49 Provincial Road that passes through the proposed Vleifontein prospecting area, and number of private farm roads. Where no roads exist, tracks will be used to access the drilling sites. No clearing of natural vegetation will be undertaken.

5.1.9. No Go Option

Copper Corp (Pty) Limited intends to prospect for copper ore and iron ore. Should the project not commence, the following will result i.e.

The reserve's economic value will not be known thus no mine will commence, which will result in the potential labour force losing their employment opportunity and all support that the mine would have provided to the local businesses which will boost the economy of the country.

Potential mining operations will also assist with the establishment of small and medium businesses and infrastructure development, community development and poverty eradication as well as to boost the local economy in the surrounding previously disadvantaged communities. Since the proposed prospecting process itself will have very low environmental impacts, as detailed in the EMPr, investigating the feasibility of future mining operations should be considered.

5.1.10. Concluding Statement

Should the prospecting results indicate that a good reserve exists on the prospecting area, feasibility studies relating to mining will commence.

5.2. DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED AND RESULTS THEREOF

Public participation is the cornerstone of any EIA process. The principles of the NEMA govern many aspects of EIA's, including public participation. The general objectives of integrated environmental management laid down in the NEMA include to "ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment". The National Environmental Management Principles include the principle that "The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary to achieve equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured", which basically means that the person responsible for the application (EAP) must ensure that provision of sufficient and transparent information on an ongoing basis to stakeholders are made to allow them to comment, and to ensure that the participation of previously disadvantaged people like women and the youth are undertaken.

In terms of the EIA Regulations, 2014, when applying for environmental authorisation, the Environmental Assessment Practitioner managing the application must conduct at least a public participation process where all potential and registered interested and affected parties, including the competent authority, are given a period of at least 30 days to submit comments on each of the basic assessment reports, environmental management programme, scoping report and environmental impact assessment report, and where applicable the closure plan. In this case a Basic Assessment Report (BAR) is considered.

This section of the BAR and EMPr will explain the public participation process taken in order to comply with the above-mentioned requirements. A number of public participation guidelines were published in a bid to assist persons responsible for the environmental authorisation applications. As much of the available guidelines were used in determining the public participation process, in guiding the public participation process of the proposed project.

Geovicon Environmental (Pty) Limited on behalf of Copper Corp (Pty) Limited is applying for an environmental authorisation for the proposed Vleifontein prospecting project. The application for the environmental authorisation is undertaken in terms of the process as laid out in part 2 of Chapter 4 under the NEMA EIA Regulations, 2014. The above-mentioned regulations require that an applicant for an environmental authorisation submit a BAR and EMPr to the competent authority after having subjected the reports to a public participation process.

In view of the above, a public participation process was initiated for the proposed Vleifontein prospecting project. The public participation process for the proposed project was designed to provide sufficient and accessible information to interested and affected parties (I&APs) in an objective manner to assist them to:

- raise issues of concern and make suggestions for enhanced benefits;
- contribute local knowledge and experience;
- verify that their issues have been captured;
- verify that their issues have been considered in the technical investigations; and
- comment on the findings of the EIA.

The following will be conducted in the undertaking of the public participation process for the proposed project.

5.2.1. Registration and BAR Phase

The public participation process commenced with the provision of potential Interested and affected parties (I&AP's) 30 days to register as interested and affected parties and to comment on the draft BAR and EMPr. The registration and commenting process starts on the 24th of June 2022 and ends on the 25th of July 2022.

5.2.1.1. Notification of potential interested and affected parties

The following methods of notification were used to notify the potential interested and affected parties of the opportunity to register during the public participation process for the proposed project:

- On the 24th of June 2022, notices were posted in the Noordwester which is distributed in host and surrounding town of the proposed prospecting area, informing the public that the BAR is in the Supingstad library. The notices were compiled in compliance with the requirements of Regulation 41(3) of the EIA Regulations, 2014.
- Written notices were sent to all surface owners and lawful occupiers of the land on which the proposed prospecting project will be undertaken.
- Site notices inviting the public to register as interested and affected parties were also used to invite comments on the BAR and EMPr from the public.
- The draft BAR and EMPr is also submitted to all the commenting authorities for their comments.
- A copy of the draft BAR and EMPr is placed in the Supingstad library.

5.2.1.2. Registered Interested and Affected Parties

The following are currently registered as interested and affected parties for the Vleifontein prospecting project:

- Department of Mineral Resources and Energy, North West Regional Office (Competent Authority).
- Department of Economic Development, Environment, Conservation and Tourism
- South African Heritage Resources Agency (Commenting Authority).
- Department of Water and Sanitation.
- Ward Councillor of Ward 1 in Ramotshere Moiloa Local Municipality
- SANRAL

- Ramotshere Moiloa Local Municipality.
- Land owners and lawful occupiers within the Vleifontein project's area.
- Land owners and lawful occupiers immediately adjacent to the project's area.

5.2.1.3. Proof of Consultation

Proof of the above-mentioned consultation and results; thereof, will be included in the final BAR and EMPr.

5.2.1.4. Finalisation of Interested and Affected Party Database

On expiry of registration period, the database of interested and affected parties will be finalised. All parties who indicated the interest of being registered as interested and affected parties will be added to the list of interested and affected parties.

Note: All organs of state, which have jurisdiction in respect of any aspect of the proposed project and the competent authority are automatically registered as interested and affected parties.

5.2.2. Draft Basic Assessment Report

The draft BAR and EMPr is made available for commenting to all relevant stakeholders during the above-mentioned registration phase of the proposed project's public participation process.

5.2.2.1. Comments, Issues and Responses on the Draft Basic Assessment Report

The comments and issues that will be raised by the interested and affected parties will be addressed and included in the final BAR and EMPr.

5.3. ENVIRONMENTAL ATTRIBUTES (BASELINE INFORMATION)

5.3.1. Geology

5.3.1.1. Regional Geology

The area is located in the north west part of South Africa and falls within the Transvaal Supergroup Basin which is characterised by interbedded by rocks of the Pretoria group, Chuniespoort group and Dwyka group.

The Transvaal Supergroup is an end-Archaean/earliest Proterozoic platform succession developed on the Kaapvaal Craton. The rocks are preserved within three structural basins: Griqualand West (Ghaap-Postmasburg Groups) in central South Africa, Kanye (Taupone-Segwagwa Groups) in eastern Botswana and Transvaal (protobasinal rocks–Chuniespoort-Pretoria-Rooiberg Groups) in northern South Africa (Moore et al,2001).

In this threefold subdivision of the Transvaal Supergroup, the lowermost sequences (eastern Chuniespoort Group), typified by basal quartz arenites, a thick succession of dolomites and upper iron formations, are most widespread and easily correlated across the two basins. The middle sequence is represented in both the Transvaal (Pretoria Group) and Griqualand West (Postmasburg Group) basins, and the uppermost volcanic-dominated sequence (Rooiberg Group) is restricted to the Transvaal basin (Eriksson et al., 1993 and Eriksson et al., 1995).

The rocks are characterized by relatively unmetamorphosed volcanic, clastic and chemical sedimentary rocks. Protobasinal clastic sediments and basaltic to rhyolitic volcanics are ascribed to fluvial deposition and subaerial extrusion (Eriksson and Clendenin, 1990).

These units' grade into the dolomites of the Chuniespoort Group, which are interpreted as having been laid down within a widespread epeiric sea; associated iron formations probably represent deposition within a distal, deeper basinal facies. The resurgent Chuniespoort depository expanded towards the northeast, and was the fourth component of a successor basin sequence, initiated in preceding Witwatersrand and Ventersdorp Supergroup times (Eriksson and Clendenin, 1990).

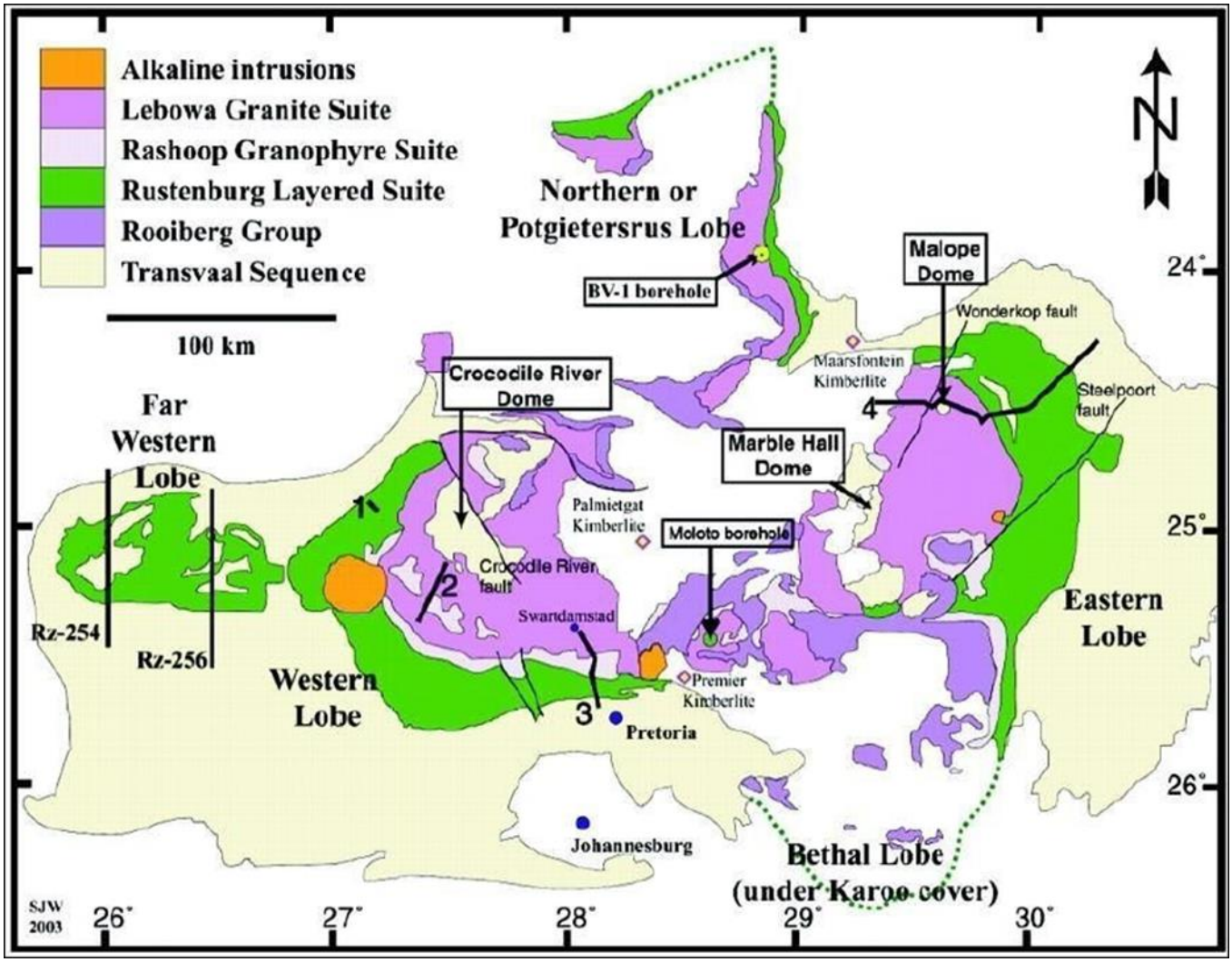


Figure 6: Geology of the proposed Vleifontein prospecting area

5.3.2. Climate

5.3.2.1. Regional Climate

Vleifontein Prospecting project falls within the summer rainfall region of South Africa, in which more than 80% of the annual rainfall occurs from October to March. Eighty five percent of the rain falls during summer thunderstorms occurring every 3 - 4 days in summer. They occur in the form of conventional thunderstorms, are usually of short duration and high intensity and accompanied by lightning, strong winds, and sometimes hail.

Temperatures in this climatic zone are generally mild, although low minimal can be experienced during the winter months due to clear night skies. Temperatures can vary between 32,5°C (maximum) to 1,7°C (minimum) in summer and 21,9°C (maximum) to –6°C (minimum) in winter.

Frost characteristically occurs in the winter months.

The annual prevailing wind direction, during the day, summer and winter months, is north-westerly, while during the equinoctial period (March to May) and during night time, the prevailing winds are from the east.

Climatic data were obtained from the word weather online website. All temperature data are presented in Table 4 below.

Table 4: Climatic conditions in the vicinity of Vleifontein prospecting area – Supingstad.

Month	Day	Night	Rain Days
January	32°c	21°c	4
February	31°c	20°c	4
March	30°c	18°c	3
April	27°c	16°c	2
May	25°c	12°c	0
June	21°c	9°c	0
July	21°c	8°c	0
August	25°c	10°c	0
September	30°c	14°c	0
October	32°c	18°c	2
November	32°c	20°c	4
December	32°c	20°c	4

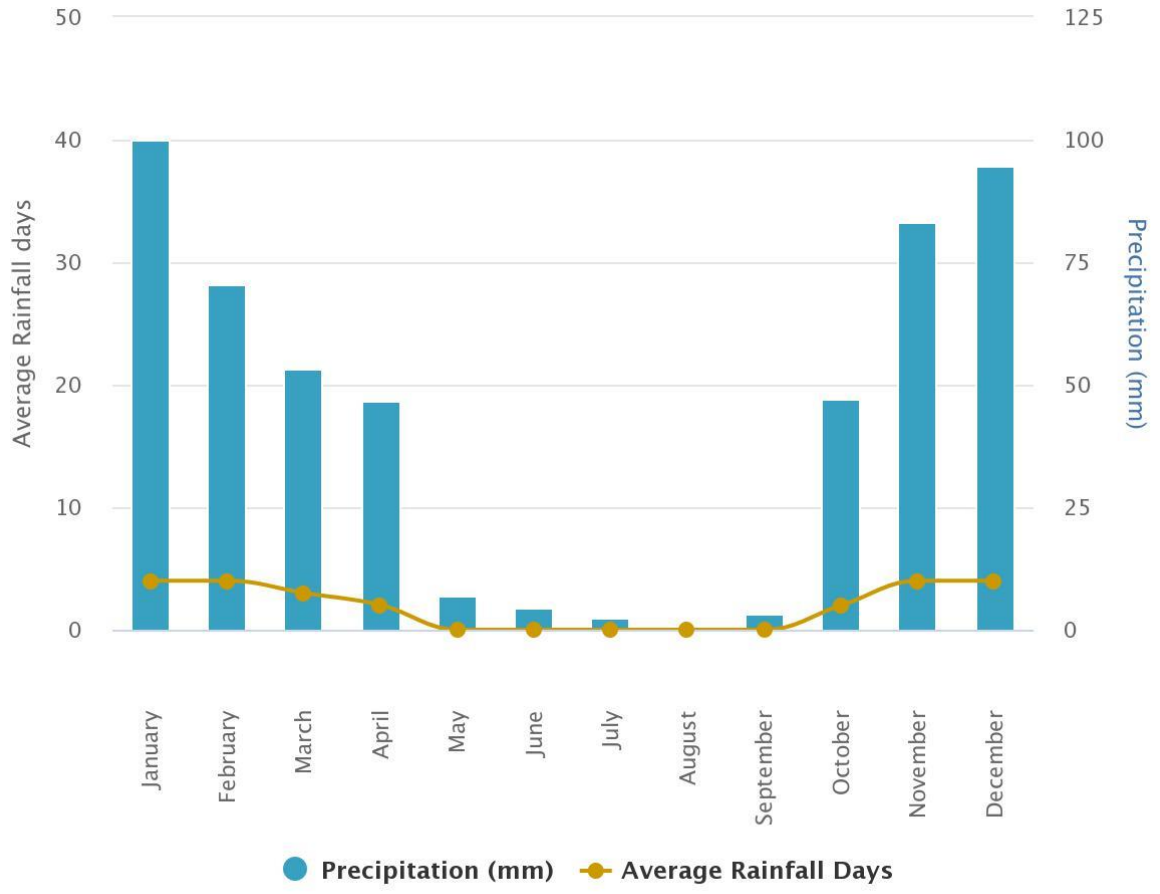


Figure 7: Mean Monthly Rainfall for Supingstad

5.3.3. Topography

The elevation of the surrounding area ranges from 1080 m above sea level to 1300m above sea level. The surrounding area is considered undulating and consists of mostly mountainous areas.

5.3.4. Soil

The proposed Vleifontein prospecting area consists out of soils influenced by the geology and vegetation types that characterise the area These soils include vertic black ultramafic clays which developed from norite and gabbro, also locally in small depressions along streams. Some areas have less clay. Some with high base status and eutrophic red soils. Other soils found in the area consists out of stony, shallow soils of the Glenrosa and Mispah forms (Mucina & Rutherford, 2006).

5.3.5. Land Use

The land in the area is mainly used for grazing with limited crop production and a farm dam on one of the properties. There is the R49 provincial road that passes through the area. Adjacent land is used for grazing, crop production and conservation. The National Game Reserve, namely the Madikwe Nature Reserve is situated directly adjacent to the proposed Vleifontein prospecting area. Refer to figure 8 for a visual indication.

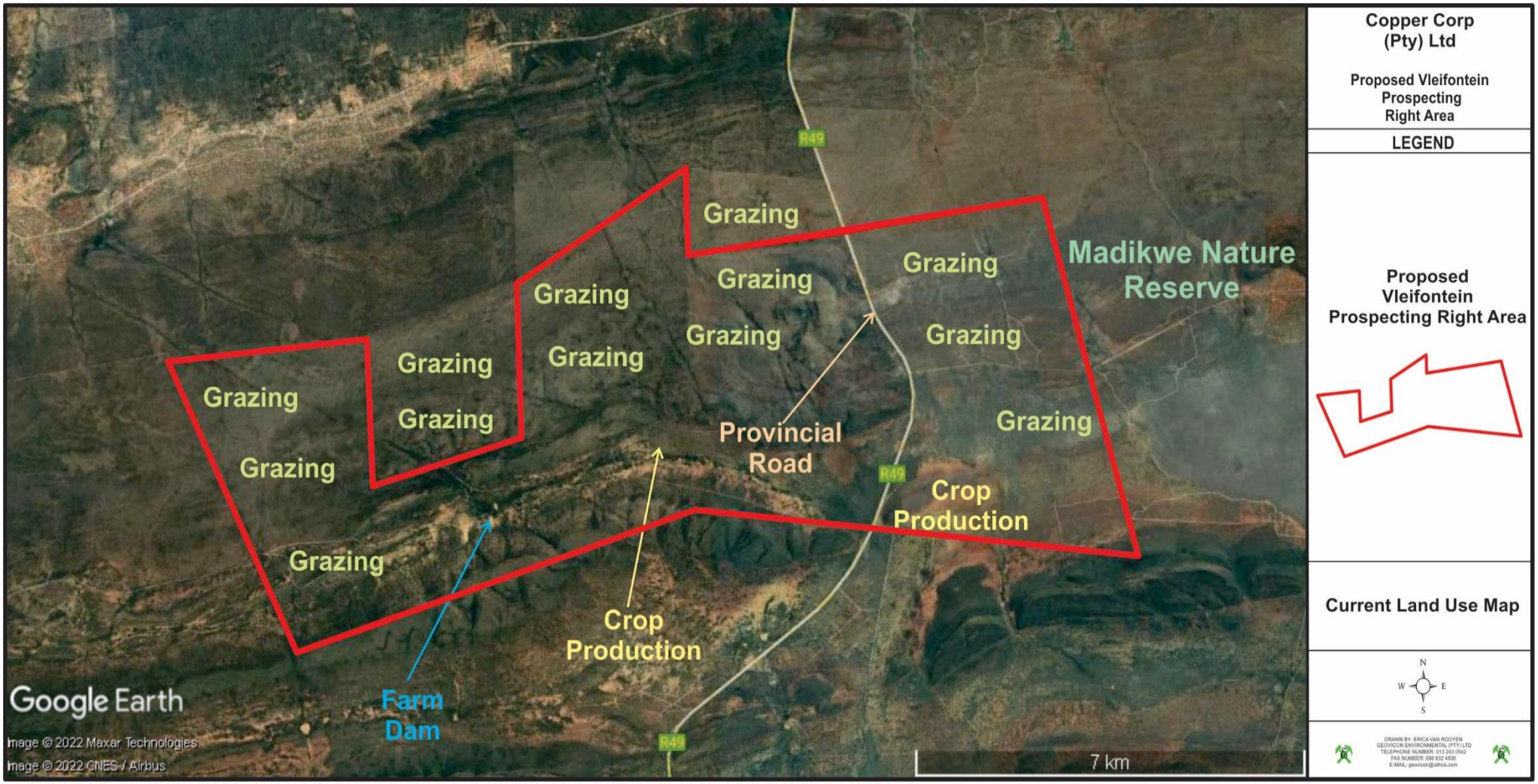


Figure 8: Current land-use map.

5.3.6. Natural Vegetation/Plant Life

According to Mucina and Rutherford (2006), the proposed Vleifontein prospecting area is situated within three different vegetation units, namely the Dwaalboom Thornveld (SVcb 1) vegetation unit/ecosystem type, the Madikwe Dolomite Bushveld (SVcb 2) vegetation unit/ecosystem type and the Dwarsberg-Swartruggens Mountain Bushveld (SVcb 4) vegetation unit/ ecosystem, all of these ecosystems are of the Central Bushveld Bioregion and they are situated in the Savanna Biome of South Africa. Figure 9, South African National Biodiversity Institute (SANBI, VEGMAP 2018) provides a visual indication of the proposed Vleifontein prospecting area and the ecosystem or vegetation units in which it occurs.

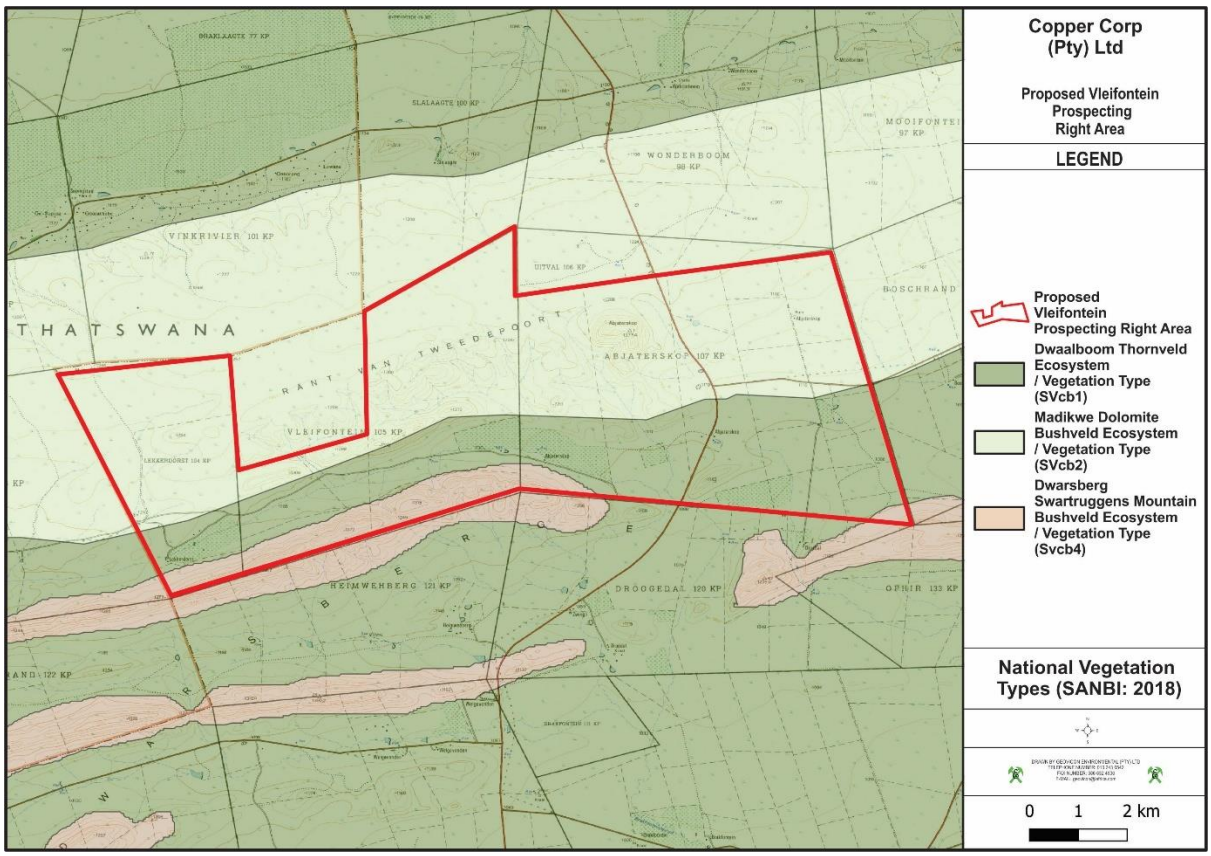


Figure 9: National Vegetation types in the vicinity of the proposed Vleifontein prospecting right area.

<u>Dwaalboom Thornveld (SVcb1)</u>

Important Taxa Tall Tree: *Acacia erioloba*.

Small Trees: *Acacia erubescens* (d), *A. nilotica* (d), *A. tortilis* subsp. *heteracantha* (d), *A. fleckii*, *A. mellifera* subsp. *detinens*, *Combretum imberbe*, *Rhus lancea*, *Ziziphus mucronata*.

Tall Shrubs: *Acacia hebeclada* subsp. *hebeclada*, *Combretum hereroense*, *Diospyros lycioides* subsp. *lycioides*, *Euclea undulata*, *Grewia flava*, *Tarchonanthus camphoratus*.

Low Shrubs: *Acacia tenuispina* (d), *Abutilon austro-africanum*, *Aptosimum elongatum*, *Hirpicium bechuanense*, *Pavonia burchellii*, *Solanum delagoense*.

Succulent Shrubs: *Kalanchoe rotundifolia*, *Talinum caffrum*. Herbaceous Climber: *Rhynchosia minima*.

Graminoids: *Aristida bipartita* (d), *Bothriochloa insculpta* (d), *Digitaria eriantha* subsp. *eriantha* (d), *Ischaemum afrum* (d), *Panicum maximum* (d), *Cymbopogon pospischilii*, *Eragrostis curvula*, Sehima galpinii, *Setaria incrassata*.

Herbs: *Heliotropium ciliatum*, *Kohautia caespitosa* subsp. *brachyloba*, *Nidorella hottentotica*.

Conservation Least threatened. Target 19%. Some 6% statutorily conserved, mostly within the Madikwe Game Reserve in the west. About 14% transformed mainly by cultivation. Erosion is very low to low. Main use is extensive cattle grazing.

Remarks Contains some very clayey soils that swell when wet and shrink when dry. On the clays, woody plant biomass is generally low and productivity of woody plants is usually lower than that of herbaceous plants. These areas with ultramafic soils are, contrary to Sekhukhuneland, low in species diversity and in endemic species

Madikwe Dolomite Bushveld (SVcb2)

Important Taxa

Tall Tree: *Sclerocarya birrea* subsp. *caffra*.

Small Trees: *Combretum apiculatum* (d), *Kirkia wilmsii* (d), *Ozoroa paniculosa* (d), *Rhus lancea* (d), *Combretum imberbe*, *Rhus leptodictya*, *Ximenia americana*, *Ziziphus mucronata*.

Tall Shrubs: *Grewia flava* (d), *Tarchonanthus camphoratus* (d), *Vitex zeyheri* (d), *Clerodendrum glabrum*, *Grewia bicolor*, *G. monticola*.

Graminoids: *Enneapogon scoparius* (d), *Heteropogon contortus* (d), *Aristida congesta*, *Panicum coloratum*, *P. maximum*

Conservation Least threatened. Target 19%. Some 17% statutorily conserved in the Madikwe Nature Reserve. Only 1% transformed mostly by cultivation. Erosion is low

Remarks Some species distributions are associated with the east-west climatic gradient, for example *Kirkia wilmsii* is restricted to the eastern parts of the unit. In contrast to bush encroachment seen on the red clay loams surrounding this unit, the rocky soils of dolomitic origin support a more open canopy structure (Hudak & Wessman 2001).

Dwarsberg Swartruggens Mountain Bushveld (SVcb 4)

Important Taxa

Tall Tree: *Acacia robusta* (d).

Small Trees: *Acacia caffra* (d), *A. erubescens* (d), *Burkea africana* (d), *Combretum apiculatum* (d), *Faurea saligna* (d), *Protea caffra* (d), *Combretum imberbe*, *C. molle*, *Cussonia paniculata*, *C. transvaalensis*, *Dombeya rotundifolia*, *Ozoroa paniculosa*, *Pappea capensis*, *Peltophorum africanum*, *Spirostachys africana*, *Vangueria infausta*, *Ziziphus mucronata*.

Succulent Tree: *Aloe marlothii* subsp. *marlothii* (d).

Tall Shrubs: *Dichrostachys cinerea* (d), *Croton pseudopulchellus*, *Ehretia rigida* subsp. *rigida*, *Grewia flava*, *Mundulea sericea*, *Tarchonanthus camphoratus*, *Vitex zeyheri*.

Low Shrubs: *Athrixia elata*, *Pavonia burchellii*, *Rhus magalismontana* subsp. *magalismontana*, *R. rigida* var. *rigida*.

Woody Climber: *Asparagus africanus*.

Graminoids: *Aristida canescens* (d), *Cenchrus ciliaris* (d), *Chrysopogon serrulatus* (d), *Digitaria eriantha* subsp. *eriantha* (d), *Enneapogon scoparius* (d), *Loudetia simplex* (d), *Schizachyrium sanguineum* (d), *Setaria lindenbergiana* (d), *Bewsia biflora*, *Bothriochloa insculpta*, *Cymbopogon caesius*, *C. pospischilii*, *Elionurus muticus*, *Eragrostis rigidior*, *Fingerhuthia africana*, *Heteropogon*

contortus, *Melinis nerviglumis*, *Panicum maximum*, *Setaria sphacelata*, *Themeda triandra*, *Trachypogon spicatus*, *Tristachya biseriata*.

Herbs: *Barleria macrostegia*, *Commelina africana*, *Hermannia depressa*, *Senecio venosus*.

Geophytic Herbs: *Hypoxis hemerocallidea*, *Pellaea calomelanos*, *Tritonia nelsonii*.

Biogeographically Important Taxon (Central Bushveld endemic)

Tall Shrub: *Erythrophysa transvaalensis*.

Endemic Taxon Succulent Shrub: *Euphorbia perangusta*.

Conservation Least threatened. Target 24%. Less than 2% statutorily conserved, mainly in the Marico Bushveld Nature Reserve. Some 7% transformed, mainly by cultivation. Aliens include scattered *Cereus jamacaru* and *Acacia mearnsii* in few areas. Erosion is mainly very low to low.

Remarks This vegetation has some similarities with the SVcb 9 Gold Reef Mountain Bushveld to the east but is drier and warmer than this unit. The unit extends into Botswana, for example on the hills around Lobatse.

5.3.7. Animal Life

The proposed Vleifontein prospecting right area is situated in the Eastern Highveld Grassland ecosystem, therefore the animal species that are likely to occur within the ecosystem, primarily inhabits the grassland habitat. In accordance with the above-mentioned land uses certain species can occur within and in the surrounding areas of the proposed Vleifontein prospecting right area. All animal species lists mentioned in the tables below have been obtained from the web-accessible Virtual Museum Animal Demography Unit. The proposed Vleifontein prospecting area is situated over the 2426CC quarter degree square grid. The tables below represent the possible occurrence of animal species found within the perimeters of the 2426CC quarter degree square grid and is not restricted to the proposed Vleifontein prospecting right area.

For the animal life determination of the proposed Vleifontein prospecting area the virtual museum of the Animal Demographic Unit Web based application was used. Bird lists were determined using the SABAP2 web-based application.

Table 5: List of Mammal species that occur in the 2426CC quarter degree grid (Mammal Map, Animal Demography Unit)

#	Species code	Family	Scientific name	Common name	Red list category
1	151470	Bathyergidae	*Cryptomys hottentotus*	Southern African Mole-rat	Least Concern (2016)
2	211850	Bovidae	*Aepyceros melampus*	Impala	Least Concern
3	211920	Bovidae	*Alcelaphus buselaphus*	Hartebeest	
4	212040	Bovidae	*Connochaetes taurinus taurinus*		Least Concern (2016)
5	217690	Bovidae	*Damaliscus lunatus lunatus*	(Southern African) Tsessebe	Vulnerable (2016)
6	212160	Bovidae	*Damaliscus pygargus phillipsi*	Blesbok	Least Concern (2016)
7	215940	Bovidae	*Hippotragus niger niger*		Vulnerable (2016)
8	216050	Bovidae	*Kobus ellipsiprymnus ellipsiprymnus*		Least Concern (2016)
9	213120	Bovidae	*Oreotragus oreotragus*	Klipspringer	Least Concern (2016)
10	216020	Bovidae	*Oryx gazella*	Gemsbok	Least Concern (2016)

11	216360	Bovidae	*Pelea capreolus*	Vaal Rhebok	Near Threatened (2016)
12	213320	Bovidae	*Raphicerus campestris*	Steenbok	Least Concern (2016)
13	216370	Bovidae	*Redunca arundinum*	Southern Reedbuck	Least Concern (2016)
14	216380	Bovidae	*Redunca fulvorufula*	Mountain Reedbuck	Least Concern
15	215700	Bovidae	*Sylvicapra grimmia*	Bush Duiker	Least Concern (2016)
16	213760	Bovidae	*Syncerus caffer*	African Buffalo	Least Concern (2008)
17	213850	Bovidae	*Taurotragus oryx*	Common Eland	Least Concern (2016)
18	213930	Bovidae	*Tragelaphus angasii*	Nyala	Least Concern (2016)
19	213970	Bovidae	*Tragelaphus scriptus*	Bushbuck	Least Concern
20	214120	Bovidae	*Tragelaphus strepsiceros*	Greater Kudu	Least Concern (2016)
21	198600	Canidae	*Canis mesomelas*	Black-backed Jackal	Least Concern (2016)
22	198960	Canidae	*Lycaon pictus*	African wild dog	Endangered (2016)
23	113300	Cercopithecidae	*Chlorocebus pygerythrus*	Vervet Monkey	Least Concern (2016)
24	113310	Cercopithecidae	*Chlorocebus pygerythrus pygerythrus*	Vervet Monkey (subspecies pygerythrus)	Least Concern (2008)
25	114040	Cercopithecidae	*Papio ursinus*	Chacma Baboon	Least Concern (2016)
26	107520	Elephantidae	*Loxodonta africana*	African Bush Elephant	Vulnerable A2a (2008)
27	207010	Equidae	*Equus quagga*	Plains Zebra	Least Concern (2016)
28	191590	Felidae	*Acinonyx jubatus*	Cheetah	Vulnerable (2016)
29	192800	Felidae	*Leptailurus serval*	Serval	Near Threatened (2016)
30	193680	Felidae	*Panthera leo*	Lion	Least Concern (2016)
31	193900	Felidae	*Panthera pardus*	Leopard	Vulnerable (2016)
32	110080	Galagidae	*Galago moholi*	Mohol Bushbaby	Least Concern (2016)
33	110120	Galagidae	*Galago senegalensis*	Senegal Bushbaby	
34	211830	Giraffidae	*Giraffa giraffa giraffa*	South African Giraffe	Least Concern (2016)
35	196340	Herpestidae	*Herpestes sanguineus*	Slender Mongoose	Least Concern (2016)
36	197350	Herpestidae	*Ichneumia albicauda*	White-tailed Mongoose	Least Concern (2016)
37	197740	Hyaenidae	*Crocuta crocuta*	Spotted Hyaena	Near Threatened (2016)
38	197750	Hyaenidae	*Hyaena brunnea*	Brown Hyena	Near Threatened (2015)
39	151730	Hystricidae	*Hystrix africaeaustralis*	Cape Porcupine	Least Concern
40	158240	Leporidae	*Lepus saxatilis*	Scrub Hare	Least Concern
41	106360	Macroscelididae	*Elephantulus brachyrhynchus*	Short-snouted Elephant Shrew	Least Concern (2016)
42	191540	Manidae	*Smutsia temminckii*	Ground Pangolin	Vulnerable (2016)
43	143879	Muridae	*Acomys sp.*	Spiny Mice	
44	145370	Muridae	*Aethomys chrysophilus*	Red Veld Aethomys	Least Concern (2016)
45	145390	Muridae	*Aethomys ineptus*	Tete Veld Aethomys	Least Concern (2016)
46	217970	Muridae	*Aethomys namaquensis*	Namaqua Rock Mouse	Least Concern

47	218030	Muridae	*Gerbilliscus leucogaster*	Bushveld Gerbil	Least Concern (2016)
48	147479	Muridae	*Mastomys sp.*	Multimammate Mice	
49	147530	Muridae	*Mastomys natalensis*	Natal Mastomys	Least Concern (2016)
50	203170	Mustelidae	*Mellivora capensis*	Honey Badger	Least Concern (2016)
51	136520	Nesomyidae	*Saccostomus campestris*	Southern African Pouched Mouse	Least Concern (2016)
52	106780	Orycteropodidae	*Orycteropus afer*	Aardvark	Least Concern (2016)
53	107300	Procaviidae	*Procavia capensis*	Cape Rock Hyrax	Least Concern (2016)
54	123710	Sciuridae	*Paraxerus cepapi*	Smith's Bush Squirrel	Least Concern (2016)
55	162390	Soricidae	*Crocidura silacea*	Lesser Gray-brown Musk Shrew	Least Concern (2016)
56	207690	Suidae	*Phacochoerus africanus*	Common Warthog	Least Concern (2016)
57	217740	Viveridae	*Genetta maculata*	Common Large-spotted Genet	Least Concern
58	195010	Viverridae	*Civettictis civetta*	African Civet	Least Concern (2016)
59	195300	Viverridae	*Genetta tigrina*	Cape Genet (Cape Large-spotted Genet)	Least Concern (2016)

Table 6: List of Reptiles that occur in the 2426CC quarter degree grid (Reptile Map, Animal Demography Unit)

#	Species code	Family	Scientific name	Common name	Red list category
1	1410	Chamaeleonidae	*Chamaeleo dilepis*	Common Flap-neck Chameleon	Least Concern (SARCA 2014)
2	3110	Cordylidae	*Cordylus jonesii*	Jones' Girdled Lizard	Least Concern (SARCA 2014)
3	5300	Elapidae	*Naja mossambica*	Mozambique Spitting Cobra	Least Concern (SARCA 2014)
4	320	Gekkonidae	*Lygodactylus capensis*	Common Dwarf Gecko	Least Concern (SARCA 2014)
5	490	Gekkonidae	*Pachydactylus capensis*	Cape Gecko	Least Concern (SARCA 2014)
6	3490	Gerrhosauridae	*Gerrhosaurus flavigularis*	Yellow-throated Plated Lizard	Least Concern (SARCA 2014)
7	1730	Lacertidae	*Nucras holubi*	Holub's Sandveld Lizard	Least Concern (SARCA 2014)
8	4910	Lamprophiidae	*Psammophis brevirostris*	Short-snouted Grass Snake	Least Concern (SARCA 2014)
9	4930	Lamprophiidae	*Psammophis subtaeniatus*	Western Yellow-bellied Sand Snake	Least Concern (SARCA 2014)
10	5780	Pelomedusidae	*Pelomedusa subrufa*	Central Marsh Terrapin	Least Concern (SARCA 2014)
11	2310	Scincidae	*Trachylepis capensis*	Cape Skink	Least Concern (SARCA 2014)
12	2450	Scincidae	*Trachylepis punctatissima*	Speckled Rock Skink	Least Concern (SARCA 2014)
13	2480	Scincidae	*Trachylepis varia sensu lato*	Common Variable Skink Complex	Least Concern (SARCA 2014)

Table 7: List of Frog species that occur in the 2426CC quarter degree grid (Frog Map, Animal Demography Unit)

#	Species code	Family	Scientific name	Common name	Red list category
1	910	Bufonidae	*Schismaderma carens*	Red Toad	Least Concern

2	320	Bufonidae	*Sclerophrys garmani*	Olive Toad	Least Concern (IUCN, 2016)
3	660	Hyperoliidae	*Kassina senegalensis*	Bubbling Kassina	Least Concern
4	760	Microhylidae	*Phrynomantis bifasciatus*	Banded Rubber Frog	Least Concern
5	780	Ptychadenidae	*Ptychadena anchietae*	Plain Grass Frog	Least Concern
6	800	Ptychadenidae	*Ptychadena mossambica*	Broadbanded Grass Frog	Least Concern
7	400	Pyxicephalidae	*Cacosternum boettgeri*	Common Caco	Least Concern (2013)
8	1245	Pyxicephalidae	*Tomopterna sp.*		
9	990	Pyxicephalidae	*Tomopterna cryptotis*	Tremelo Sand Frog	Least Concern
10	470	Rhacophoridae	*Chiromantis xerampelina*	Southern Foam Nest Frog	Least Concern (2013)

Table 8: List of Butterfly and Moth species in the 2426CC quarter degree grid (LepiMap, Animal Demography Unit)

#	Species code	Family	Scientific name	Common name	Red list category
1	471340	HESPERIIDAE	*Spialia spio*	Mountain sandman	Least Concern (SABCA 2013)
2	584360	LASIOCAMPIDAE	*Trichopisthia monteiroi*		
3	459570	LYCAENIDAE	*Aloeides taikosama*	Dusky russet	Least Concern (SABCA 2013)
4	460430	LYCAENIDAE	*Anthene amarah amarah*	Black-striped ciliate blue	Least Concern (SABCA 2013)
5	464490	LYCAENIDAE	*Tarucus sybaris sybaris*	Dotted pierrot	Least Concern (SABCA 2013)
6	464330	LYCAENIDAE	*Tuxentius melaena melaena*	Black pie	Least Concern (SABCA 2013)
7	413770	NYMPHALIDAE	*Telchinia serena*	Dancing telchinia	Least Concern (SABCA 2013)
8	407450	PIERIDAE	*Belenois aurota*	Pioneer caper white	Least Concern (SABCA 2013)
9	403720	PIERIDAE	*Colotis* sp.		
10	403740	PIERIDAE	*Colotis annae annae*	Scarlet tip	Least Concern (SABCA 2013)
11	403830	PIERIDAE	*Colotis auxo auxo*	Sulphur orange tip	Least Concern (SABCA 2013)
12	404760	PIERIDAE	*Colotis vesta argillaceus*	Southern veined arab	Least Concern (SABCA 2013)
13	402930	PIERIDAE	*Eurema brigitta brigitta*	Broad-bordered grass yellow	Least Concern (SABCA 2013)

There are no records of any dungbeetle species or damselfly and dragonfly species that occur in the 2426CC quarter degree square.

The lists of bird species were determined by using the South African Bird Atlas Project Version 2 Web Application. The proposed Vleifontein prospecting area is situated over two ADU pentad ID's, 244_2605 and 2445_2610, respectively.

Table 9: List of bird species that occur within the 2445_2605 ADU Pentad (SABAP2, web-based application)

Ref	Common_group	Common_species	Genus	Species	Status
84	Ibis	Hadada	*Bostrychia*	*hagedash*	
89	Goose	Egyptian	*Alopochen*	*aegyptiaca*	

122	Kestrel	Greater	*Falco*	*rupicoloides*	
129	Kite	Yellow-billed	*Milvus*	*aegyptius*	
130	Kite	Black-winged	*Elanus*	*caeruleus*	
145	Eagle	Brown Snake	*Circaetus*	*cinereus*	
146	Eagle	Black-chested Snake	*Circaetus*	*pectoralis*	
154	Buzzard	Common	*Buteo*	*buteo*	
162	Goshawk	Gabar	*Micronisus*	*gabar*	
174	Francolin	Crested	*Dendroperdix*	*sephaena*	
183	Spurfowl	Natal	*Pternistis*	*natalensis*	
185	Spurfowl	Swainson's	*Pternistis*	*swainsonii*	
192	Guineafowl	Helmeted	*Numida*	*meleagris*	
224	Korhaan	Red-crested	*Lophotis*	*ruficrista*	
242	Lapwing	Crowned	*Vanellus*	*coronatus*	
316	Dove	Cape Turtle	*Streptopelia*	*capicola*	
317	Dove	Laughing	*Spilopelia*	*senegalensis*	
318	Dove	Namaqua	*Oena*	*capensis*	
321	Dove	Emerald-spotted Wood	*Turtur*	*chalcospilos*	
339	Go-away-bird	Grey	*Crinifer*	*concolor*	
343	Cuckoo	Red-chested	*Cuculus*	*solitarius*	
348	Cuckoo	Jacobin	*Clamator*	*jacobinus*	
351	Cuckoo	Klaas's	*Chrysococcyx*	*klaas*	
352	Cuckoo	Diederik	*Chrysococcyx*	*caprius*	
383	Swift	White-rumped	*Apus*	*caffer*	
385	Swift	Little	*Apus*	*affinis*	
392	Mousebird	Red-faced	*Urocolius*	*indicus*	
402	Kingfisher	Brown-hooded	*Halcyon*	*albiventris*	
404	Bee-eater	European	*Merops*	*apiaster*	
412	Roller	European	*Coracias*	*garrulus*	Near Threatened

418	Hoopoe	African	*Upupa*	*africana*	
424	Hornbill	African Grey	*Lophoceros*	*nasutus*	
426	Hornbill	Southern Yellow-billed	*Tockus*	*leucomelas*	
432	Barbet	Acacia Pied	*Tricholaema*	*leucomelas*	
437	Tinkerbird	Yellow-fronted	*Pogoniulus*	*chrysoconus*	
451	Woodpecker	Bearded	*Chloropicus*	*namaquus*	
460	Lark	Sabota	*Calendulauda*	*sabota*	
493	Swallow	Barn	*Hirundo*	*rustica*	
503	Swallow	Lesser Striped	*Cecropis*	*abyssinica*	
507	Martin	Common House	*Delichon*	*urbicum*	
517	Drongo	Fork-tailed	*Dicrurus*	*adsimilis*	
521	Oriole	Black-headed	*Oriolus*	*larvatus*	
522	Crow	Pied	*Corvus*	*albus*	
527	Tit	Southern Black	*Melaniparus*	*niger*	
533	Babbler	Arrow-marked	*Turdoides*	*jardineii*	
536	Babbler	Southern Pied	*Turdoides*	*bicolor*	
544	Bulbul	African Red-eyed	*Pycnonotus*	*nigricans*	
552	Thrush	Kurrichane	*Turdus*	*libonyana*	
557	Thrush	Groundscraper	*Turdus*	*litsitsirupa*	
570	Chat	Familiar	*Oenanthe*	*familiaris*	
573	Chat	Mocking Cliff	*Thamnolaea*	*cinnamomeiventris*	
586	Scrub Robin	Kalahari	*Cercotrichas*	*paena*	
588	Scrub Robin	White-browed	*Cercotrichas*	*leucophrys*	
607	Warbler	Marsh	*Acrocephalus*	*palustris*	
614	Wren-Warbler	Barred	*Calamonastes*	*fasciolatus*	
621	Crombec	Long-billed	*Sylvietta*	*rufescens*	
628	Camaroptera	Grey-backed	*Camaroptera*	*brevicaudata*	
637		Neddicky	*Cisticola*	*fulvicapilla*	

642	Cisticola	Rattling	*Cisticola*	*chiniana*	
650	Prinia	Black-chested	*Prinia*	*flavicans*	
658	Warbler	Chestnut-vented	*Curruca*	*subcoerulea*	
661	Flycatcher	Marico	*Melaenornis*	*mariquensis*	
673	Batis	Chinspot	*Batis*	*molitor*	
706	Shrike	Lesser Grey	*Lanius*	*minor*	
708	Shrike	Red-backed	*Lanius*	*collurio*	
711	Shrike	Crimson-breasted	*Laniarius*	*atrococcineus*	
712	Puffback	Black-backed	*Dryoscopus*	*cubla*	
714	Tchagra	Brown-crowned	*Tchagra*	*australis*	
730	Shrike	Southern White-crowned	*Eurocephalus*	*anguitimens*	
734	Myna	Common	*Acridotheres*	*tristis*	
736	Starling	Violet-backed	*Cinnyricinclus*	*leucogaster*	
737	Starling	Cape	*Lamprotornis*	*nitens*	
748	Oxpecker	Red-billed	*Buphagus*	*erythrorynchus*	
755	Sunbird	Marico	*Cinnyris*	*mariquensis*	
779	Weaver	Red-billed Buffalo	*Bubalornis*	*niger*	
780	Sparrow-Weaver	White-browed	*Plocepasser*	*mahali*	
785	Sparrow	Great	*Passer*	*motitensis*	
803	Weaver	Southern Masked	*Ploceus*	*velatus*	
805	Quelea	Red-billed	*Quelea*	*quelea*	
814	Widowbird	White-winged	*Euplectes*	*albonotatus*	
830	Pytilia	Green-winged	*Pytilia*	*melba*	
835	Firefinch	Jameson's	*Lagonosticta*	*rhodopareia*	
839	Waxbill	Blue	*Uraeginthus*	*angolensis*	
840	Waxbill	Violet-eared	*Granatina*	*granatina*	
847	Whydah	Shaft-tailed	*Vidua*	*regia*	
850	Indigobird	Purple	*Vidua*	*purpurascens*	

852	Whydah	Long-tailed Paradise	*Vidua*	*paradisaea*	
4129	Hornbill	Southern Red-billed	*Tockus*	*rufirostris*	
4142	Sparrow	Southern Grey-headed	*Passer*	*diffusus*	

Table 10: List of bird species that occur within the 2445_2610 ADU Pentad (SABAP2, web-based application

Ref	Common_group	Common_species	Genus	Species	Status
1	Ostrich	Common	*Struthio*	*camelus*	
6	Grebe	Little	*Tachybaptus*	*ruficollis*	
50	Cormorant	Reed	*Microcarbo*	*africanus*	
54	Heron	Grey	*Ardea*	*cinerea*	
59	Egret	Little	*Egretta*	*garzetta*	
61	Egret	Western Cattle	*Bubulcus*	*ibis*	
62	Heron	Squacco	*Ardeola*	*ralloides*	
66	Bittern	Dwarf	*Ixobrychus*	*sturmii*	
78	Stork	Abdim's	*Ciconia*	*abdimii*	Near Threatened
79	Stork	Black	*Ciconia*	*nigra*	Vulnerable
80	Stork	White	*Ciconia*	*ciconia*	
84	Ibis	Hadada	*Bostrychia*	*hagedash*	
85	Spoonbill	African	*Platalea*	*alba*	
89	Goose	Egyptian	*Alopochen*	*aegyptiaca*	
90	Shelduck	South African	*Tadorna*	*cana*	
91	Duck	Knob-billed	*Sarkidiornis*	*melanotos*	
96	Duck	Yellow-billed	*Anas*	*undulata*	
97	Teal	Red-billed	*Anas*	*erythrorhyncha*	
102	Pochard	Southern	*Netta*	*erythrophthalma*	
106	Vulture	Cape	*Gyps*	*coprotheres*	Endangered

107	Vulture	White-backed	*Gyps*	*africanus*	Critically Endangered
108	Vulture	Lappet-faced	*Torgos*	*tracheliotos*	Endangered
113	Falcon	Peregrine	*Falco*	*peregrinus*	
114	Falcon	Lanner	*Falco*	*biarmicus*	Vulnerable
119	Falcon	Amur	*Falco*	*amurensis*	
127	Cuckoo-Hawk	African	*Aviceda*	*cuculoides*	
129	Kite	Yellow-billed	*Milvus*	*aegyptius*	
130	Kite	Black-winged	*Elanus*	*caeruleus*	
132	Honey-buzzard	European	*Pernis*	*apivorus*	
134	Eagle	Tawny	*Aquila*	*rapax*	Endangered
135	Eagle	Steppe	*Aquila*	*nipalensis*	
137	Eagle	Wahlberg's	*Hieraaetus*	*wahlbergi*	
139	Eagle	Booted	*Hieraaetus*	*pennatus*	
141	Hawk-eagle	African	*Aquila*	*spilogaster*	
142	Eagle	Martial	*Polemaetus*	*bellicosus*	Endangered
145	Eagle	Brown Snake	*Circaetus*	*cinereus*	
146	Eagle	Black-chested Snake	*Circaetus*	*pectoralis*	
154	Buzzard	Common	*Buteo*	*buteo*	
158	Sparrowhawk	Little	*Accipiter*	*minullus*	
161		Shikra	*Accipiter*	*badius*	
162	Goshawk	Gabar	*Micronisus*	*gabar*	
163	Goshawk	Dark Chanting	*Melierax*	*metabates*	
165	Goshawk	Pale Chanting	*Melierax*	*canorus*	
171	Harrier-Hawk	African	*Polyboroides*	*typus*	
172	Osprey	Western	*Pandion*	*haliaetus*	
173	Francolin	Coqui	*Peliperdix*	*coqui*	
174	Francolin	Crested	*Dendroperdix*	*sephaena*	

183	Spurfowl	Natal	*Pternistis*	*natalensis*	
185	Spurfowl	Swainson's	*Pternistis*	*swainsonii*	
190	Quail	Harlequin	*Coturnix*	*delegorguei*	
192	Guineafowl	Helmeted	*Numida*	*meleagris*	
196	Buttonquail	Common	*Turnix*	*sylvaticus*	
199	Crake	African	*Crecopsis*	*egregia*	
203	Crake	Black	*Zapornia*	*flavirostra*	
210	Moorhen	Common	*Gallinula*	*chloropus*	
211	Moorhen	Lesser	*Paragallinula*	*angulata*	
212	Coot	Red-knobbed	*Fulica*	*cristata*	
217	Bustard	Kori	*Ardeotis*	*kori*	Near Threatened
224	Korhaan	Red-crested	*Lophotis*	*ruficrista*	
230	Painted-snipe	Greater	*Rostratula*	*benghalensis*	Near Threatened
238	Plover	Three-banded	*Charadrius*	*tricollaris*	
242	Lapwing	Crowned	*Vanellus*	*coronatus*	
245	Lapwing	Blacksmith	*Vanellus*	*armatus*	
264	Sandpiper	Wood	*Tringa*	*glareola*	
275	Thick-knee	Spotted	*Burhinus*	*capensis*	
277	Courser	Temminck's	*Cursorius*	*temminckii*	
280	Courser	Bronze-winged	*Rhinoptilus*	*chalcopterus*	
310	Sandgrouse	Double-banded	*Pterocles*	*bicinctus*	
311	Pigeon	Speckled	*Columba*	*guinea*	
314	Dove	Red-eyed	*Streptopelia*	*semitorquata*	
316	Dove	Cape Turtle	*Streptopelia*	*capicola*	
317	Dove	Laughing	*Spilopelia*	*senegalensis*	
318	Dove	Namaqua	*Oena*	*capensis*	
321	Dove	Emerald-spotted Wood	*Turtur*	*chalcospilos*	

323	Pigeon	African Green	*Treron*	*calvus*	
339	Go-away-bird	Grey	*Crinifer*	*concolor*	
340	Cuckoo	Common	*Cuculus*	*canorus*	
343	Cuckoo	Red-chested	*Cuculus*	*solitarius*	
344	Cuckoo	Black	*Cuculus*	*clamosus*	
346	Cuckoo	Great Spotted	*Clamator*	*glandarius*	
347	Cuckoo	Levaillant's	*Clamator*	*levaillantii*	
348	Cuckoo	Jacobin	*Clamator*	*jacobinus*	
351	Cuckoo	Klaas's	*Chrysococcyx*	*klaas*	
352	Cuckoo	Diederik	*Chrysococcyx*	*caprius*	
359	Owl	Western Barn	*Tyto*	*alba*	
361	Owl	Marsh	*Asio*	*capensis*	
363	Owl	African Scops	*Otus*	*senegalensis*	
365	Owlet	Pearl-spotted	*Glaucidium*	*perlatum*	
368	Eagle-Owl	Spotted	*Bubo*	*africanus*	
369	Eagle-Owl	Verreaux's	*Bubo*	*lacteus*	
371	Nightjar	European	*Caprimulgus*	*europaeus*	
372	Nightjar	Rufous-cheeked	*Caprimulgus*	*rufigena*	
373	Nightjar	Fiery-necked	*Caprimulgus*	*pectoralis*	
380	Swift	African Black	*Apus*	*barbatus*	
383	Swift	White-rumped	*Apus*	*caffer*	
385	Swift	Little	*Apus*	*affinis*	
387	Swift	African Palm	*Cypsiurus*	*parvus*	
390	Mousebird	Speckled	*Colius*	*striatus*	
391	Mousebird	White-backed	*Colius*	*colius*	
392	Mousebird	Red-faced	*Urocolius*	*indicus*	
399	Kingfisher	Woodland	*Halcyon*	*senegalensis*	
402	Kingfisher	Brown-hooded	*Halcyon*	*albiventris*	

403	Kingfisher	Striped	*Halcyon*	*chelicuti*	
404	Bee-eater	European	*Merops*	*apiaster*	
410	Bee-eater	Little	*Merops*	*pusillus*	
412	Roller	European	*Coracias*	*garrulus*	Near Threatened
413	Roller	Lilac-breasted	*Coracias*	*caudatus*	
415	Roller	Purple	*Coracias*	*naevius*	
418	Hoopoe	African	*Upupa*	*africana*	
419	Wood Hoopoe	Green	*Phoeniculus*	*purpureus*	
421	Scimitarbill	Common	*Rhinopomastus*	*cyanomelas*	
424	Hornbill	African Grey	*Lophoceros*	*nasutus*	
426	Hornbill	Southern Yellow-billed	*Tockus*	*leucomelas*	
431	Barbet	Black-collared	*Lybius*	*torquatus*	
432	Barbet	Acacia Pied	*Tricholaema*	*leucomelas*	
439	Barbet	Crested	*Trachyphonus*	*vaillantii*	
440	Honeyguide	Greater	*Indicator*	*indicator*	
442	Honeyguide	Lesser	*Indicator*	*minor*	
443	Honeybird	Brown-backed	*Prodotiscus*	*regulus*	
447	Woodpecker	Golden-tailed	*Campethera*	*abingoni*	
450	Woodpecker	Cardinal	*Dendropicos*	*fuscescens*	
451	Woodpecker	Bearded	*Chloropicus*	*namaquus*	
457	Lark	Monotonous	*Mirafra*	*passerina*	
458	Lark	Rufous-naped	*Mirafra*	*africana*	
460	Lark	Sabota	*Calendulauda*	*sabota*	
464	Lark	Dusky	*Pinarocorys*	*nigricans*	
484	Sparrow-Lark	Chestnut-backed	*Eremopterix*	*leucotis*	
493	Swallow	Barn	*Hirundo*	*rustica*	
501	Swallow	Red-breasted	*Cecropis*	*semirufa*	

502	Swallow	Greater Striped	*Cecropis*	*cucullata*	
503	Swallow	Lesser Striped	*Cecropis*	*abyssinica*	
506	Martin	Rock	*Ptyonoprogne*	*fuligula*	
507	Martin	Common House	*Delichon*	*urbicum*	
509	Martin	Brown-throated	*Riparia*	*paludicola*	
513	Cuckooshrike	Black	*Campephaga*	*flava*	
514	Tit	Ashy	*Melaniparus*	*cinerascens*	
517	Drongo	Fork-tailed	*Dicrurus*	*adsimilis*	
521	Oriole	Black-headed	*Oriolus*	*larvatus*	
522	Crow	Pied	*Corvus*	*albus*	
527	Tit	Southern Black	*Melaniparus*	*niger*	
531	Tit	Cape Penduline	*Anthoscopus*	*minutus*	
533	Babbler	Arrow-marked	*Turdoides*	*jardineii*	
536	Babbler	Southern Pied	*Turdoides*	*bicolor*	
544	Bulbul	African Red-eyed	*Pycnonotus*	*nigricans*	
545	Bulbul	Dark-capped	*Pycnonotus*	*tricolor*	
552	Thrush	Kurrichane	*Turdus*	*libonyana*	
557	Thrush	Groundscraper	*Turdus*	*litsitsirupa*	
561	Thrush	Short-toed Rock	*Monticola*	*brevipes*	
568	Wheatear	Capped	*Oenanthe*	*pileata*	
570	Chat	Familiar	*Oenanthe*	*familiaris*	
573	Chat	Mocking Cliff	*Thamnolaea*	*cinnamomeiventris*	
575	Chat	Ant-eating	*Myrmecocichla*	*formicivora*	
576	Stonechat	African	*Saxicola*	*torquatus*	
582	Robin-Chat	White-throated	*Cossypha*	*humeralis*	
586	Scrub Robin	Kalahari	*Cercotrichas*	*paena*	
588	Scrub Robin	White-browed	*Cercotrichas*	*leucophrys*	
594	Whitethroat	Common	*Curruca*	*communis*	

595	Warbler	Garden	*Sylvia*	*borin*	
596	Warbler	Icterine	*Hippolais*	*icterina*	
599	Warbler	Willow	*Phylloscopus*	*trochilus*	
600	Eremomela	Yellow-bellied	*Eremomela*	*icteropygialis*	
601	Eremomela	Burnt-necked	*Eremomela*	*usticollis*	
614	Wren-Warbler	Barred	*Calamonastes*	*fasciolatus*	
621	Crombec	Long-billed	*Sylvietta*	*rufescens*	
622	Apalis	Bar-throated	*Apalis*	*thoracica*	
628	Camaroptera	Grey-backed	*Camaroptera*	*brevicaudata*	
629	Cisticola	Zitting	*Cisticola*	*juncidis*	
630	Cisticola	Desert	*Cisticola*	*aridulus*	
637		Neddicky	*Cisticola*	*fulvicapilla*	
641	Cisticola	Tinkling	*Cisticola*	*rufilatus*	
642	Cisticola	Rattling	*Cisticola*	*chiniana*	
646	Cisticola	Levaillant's	*Cisticola*	*tinniens*	
649	Prinia	Tawny-flanked	*Prinia*	*subflava*	
650	Prinia	Black-chested	*Prinia*	*flavicans*	
654	Flycatcher	Spotted	*Muscicapa*	*striata*	
657	Tit-Flycatcher	Grey	*Myioparus*	*plumbeus*	
658	Warbler	Chestnut-vented	*Curruca*	*subcoerulea*	
661	Flycatcher	Marico	*Melaenornis*	*mariquensis*	
662	Flycatcher	Pale	*Melaenornis*	*pallidus*	
664	Flycatcher	Southern Black	*Melaenornis*	*pammelaina*	
665	Flycatcher	Fiscal	*Melaenornis*	*silens*	
673	Batis	Chinspot	*Batis*	*molitor*	
682	Flycatcher	African Paradise	*Terpsiphone*	*viridis*	
692	Pipit	African	*Anthus*	*cinnamomeus*	
694	Pipit	Plain-backed	*Anthus*	*leucophrys*	

695	Pipit	Buffy	*Anthus*	*vaalensis*	
706	Shrike	Lesser Grey	*Lanius*	*minor*	
707	Fiscal	Southern	*Lanius*	*collaris*	
708	Shrike	Red-backed	*Lanius*	*collurio*	
709	Boubou	Southern	*Laniarius*	*ferrugineus*	
711	Shrike	Crimson-breasted	*Laniarius*	*atrococcineus*	
712	Puffback	Black-backed	*Dryoscopus*	*cubla*	
714	Tchagra	Brown-crowned	*Tchagra*	*australis*	
715	Tchagra	Black-crowned	*Tchagra*	*senegalus*	
719	Bushshrike	Orange-breasted	*Chlorophoneus*	*sulfureopectus*	
723	Bushshrike	Grey-headed	*Malaconotus*	*blanchoti*	
724	Shrike	Magpie	*Urolestes*	*melanoleucus*	
730	Shrike	Southern White-crowned	*Eurocephalus*	*anguitimens*	
731		Brubru	*Nilaus*	*afer*	
734	Myna	Common	*Acridotheres*	*tristis*	
735	Starling	Wattled	*Creatophora*	*cinerea*	
736	Starling	Violet-backed	*Cinnyricinclus*	*leucogaster*	
737	Starling	Cape	*Lamprotornis*	*nitens*	
743	Starling	Burchell's	*Lamprotornis*	*australis*	
745	Starling	Red-winged	*Onychognathus*	*morio*	
748	Oxpecker	Red-billed	*Buphagus*	*erythrorynchus*	
755	Sunbird	Marico	*Cinnyris*	*mariquensis*	
763	Sunbird	White-bellied	*Cinnyris*	*talatala*	
772	Sunbird	Amethyst	*Chalcomitra*	*amethystina*	
779	Weaver	Red-billed Buffalo	*Bubalornis*	*niger*	
780	Sparrow-Weaver	White-browed	*Plocepasser*	*mahali*	
784	Sparrow	House	*Passer*	*domesticus*	
785	Sparrow	Great	*Passer*	*motitensis*	

786	Sparrow	Cape	*Passer*	*melanurus*	
788	Sparrow	Yellow-throated Bush	*Gymnoris*	*superciliaris*	
789	Weaver	Scaly-feathered	*Sporopipes*	*squamifrons*	
792	Masked-weaver	Lesser	*Ploceus*	*intermedius*	
793	Weaver	Red-headed	*Anaplectes*	*rubriceps*	
797	Weaver	Village	*Ploceus*	*cucullatus*	
803	Weaver	Southern Masked	*Ploceus*	*velatus*	
805	Quelea	Red-billed	*Quelea*	*quelea*	
814	Widowbird	White-winged	*Euplectes*	*albonotatus*	
820	Finch	Red-headed	*Amadina*	*erythrocephala*	
821	Finch	Cut-throat	*Amadina*	*fasciata*	
830	Pytilia	Green-winged	*Pytilia*	*melba*	
835	Firefinch	Jameson's	*Lagonosticta*	*rhodopareia*	
837	Firefinch	Red-billed	*Lagonosticta*	*senegala*	
839	Waxbill	Blue	*Uraeginthus*	*angolensis*	
840	Waxbill	Violet-eared	*Granatina*	*granatina*	
841	Waxbill	Black-faced	*Brunhilda*	*erythronotos*	
843	Waxbill	Common	*Estrilda*	*astrild*	
844		Quailfinch	*Ortygospiza*	*atricollis*	
846	Whydah	Pin-tailed	*Vidua*	*macroura*	
847	Whydah	Shaft-tailed	*Vidua*	*regia*	
850	Indigobird	Purple	*Vidua*	*purpurascens*	
851	Indigobird	Village	*Vidua*	*chalybeata*	
852	Whydah	Long-tailed Paradise	*Vidua*	*paradisaea*	
859	Canary	Yellow-fronted	*Crithagra*	*mozambica*	
860	Canary	Black-throated	*Crithagra*	*atrogularis*	
866	Canary	Yellow	*Crithagra*	*flaviventris*	
871	Bunting	Lark-like	*Emberiza*	*impetuani*	

872	Bunting	Cinnamon-breasted	*Emberiza*	*tahapisi*	
874	Bunting	Golden-breasted	*Emberiza*	*flaviventris*	
1104	Thrush	Karoo	*Turdus*	*smithi*	
1172	White-eye	Cape	*Zosterops*	*virens*	
4129	Hornbill	Southern Red-billed	*Tockus*	*rufirostris*	
4131	Coucal	Burchell's	*Centropus*	*burchellii*	
4142	Sparrow	Southern Grey-headed	*Passer*	*diffusus*	

5.3.8. Surface Water

The proposed Vleifontein prospecting project is situated over the A10B, A10C, A32C and A32D quaternary catchment areas (Figure 10). The Segakwane River originates to the north of the proposed Vleifontein prospecting right area boundary. There is an unknown non-perennial tributary that flows into the Brakfonteinspruit, which flows south of the proposed Vleifontein prospecting area and it drains into the Molatedi Dam.

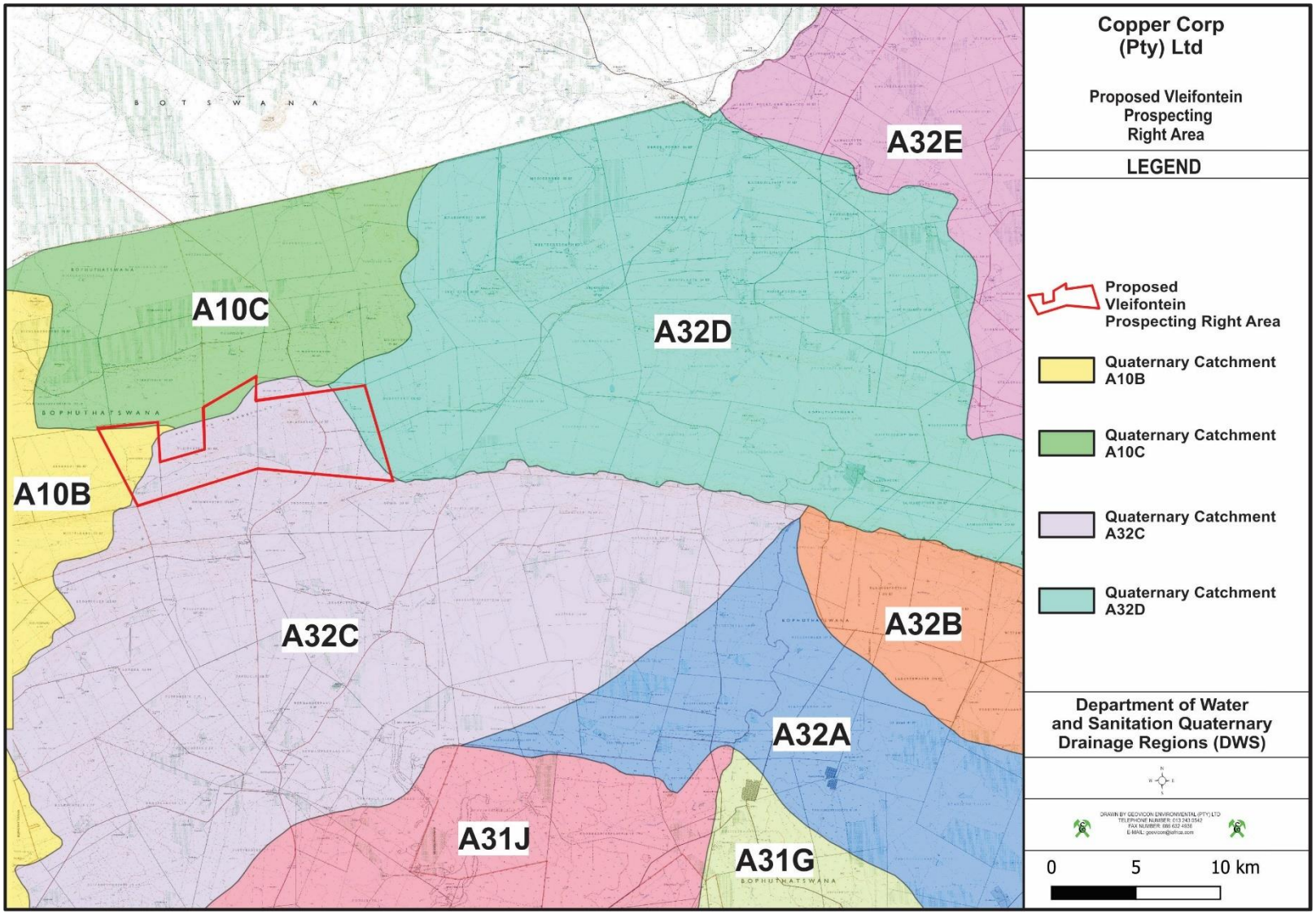


Figure 10: Quaternary catchment areas of the proposed prospecting right area

Table 11: Summary of the above-mentioned Quaternary Catchments

	A10B	A10C	A32C	A32D
Drains into	Limpopo River	Limpopo River	Limpopo River	Limpopo River
Size in km²	1014	271	903	844
Mean annual precipitation (mm)	531,30	537,40	528,50	533,10
Evaporation (mm)	2584,90	2562,50	2560,20	2546,10
Mean annual surface runoff (mm)	45,1	36,10	43,40	35,50

River diversions
No river diversions are planned for the prospecting activities covered by this report.

Water Use

The likely downstream users were determined by examining aerial photography and literature surveys.

The downstream users were therefore considered in the stream. The downstream usage classes are evaluated below:

- Domestic users –local inhabitants may consume this river water and will likely also use the water for laundry.
- Recreational users – it is likely that local inhabitants will swim in the streams.
- Aquatic users – fishing.
- Irrigation users – the river water is might to be used for small-scale or informal irrigation.
- Livestock – the river water is likely to be used for drinking by livestock.

Water Authority

The catchment area is government water-controlled catchment. The authority in charge is the Department of Water and Sanitation (North West Regional Office).

5.3.9. Groundwater

The proposed prospecting area falls within the Bushveld Igneous Complex.

Bushveld Igneous Complex

Shallow weathered aquifer

The host geology of the area consists of Bushveld Complex intrusive rock of the critical zone (anorthosite, norite, pyroxenite and chromitite). Most of the groundwater flow will be along the fracture zones that occur in the relatively competent host rock.

Deep non-weathered aquifer

Dolerite intrusions in the form of dykes are present in the igneous rocks of the Bushveld Complex, and are often encountered in this area. These intrusions can serve both as aquifers and aquifuges. Due to the higher

transmissivity, the dyke acts as a preferential pathway for the groundwater. The intrusion forms a natural cut-off trench and groundwater tends to migrate along the strike of these intrusions, causing lower groundwater levels on the down gradient side of the intrusion.

Although these aquifers vary considerably regarding geohydrological characteristics, they are seldom observed as isolated units. Usually, they would be highly interconnected by means of fractures and intrusions. Groundwater will thus flow through the system by means of the path of least resistance in a complicated manner that might include any of these components.

5.3.10. Sensitive Landscapes

Copper Corp (Pty) Ltd recognises that all streams and wetlands, terrestrial and freshwater critical biodiversity areas as well as South African Conservation Areas and protected areas should be treated as sensitive landscapes. A National Web Based Environmental Screening Tool Report has been generated and is attached as **Appendix D**.

The proposed Vleifontein prospecting area is not situated within any threatened ecosystems of South Africa.

The proposed Vleifontein prospecting right area is not situated in the vicinity of a strategic water source area of South Africa,

The proposed Vleifontein prospecting right area is situated in the vicinity of National River Freshwater Ecosystem Priority Areas, namely Freshwater Ecosystem Priority Areas (FEPAs) and Phase 2 FEPAs. According to the Atlas of Ecosystem Priority Areas in South Africa (2011), FEPAs are described as the river reach that is required to meet biodiversity targets for river ecosystems and threatened fish species. In managing the condition of a FEPA, it is important to manage not only the river itself, but also the network of streams and wetlands as well as land-based activities in the sub-catchment that supports the river FEPA. A proportion of tributaries and wetlands need to remain healthy and functional in order for the FEPA to be kept in a good ecological condition. This requires that management activities are focussed on maintaining water quantity and quality and the integrity of natural habitat in the sub-catchment. Phase 2 FEPAs were identified in moderately modified rivers (C ecological category), only in cases where it was not possible to meet biodiversity targets for river ecosystems in rivers that were still in good condition (A or B ecological category). River condition of these Phase 2 FEPAs should not be degraded further, as they may in future be considered for rehabilitation once FEPAs in good condition (A or B ecological category) are considered fully rehabilitated and well managed See Figure 11 for a visual indication of the above-mentioned statement.

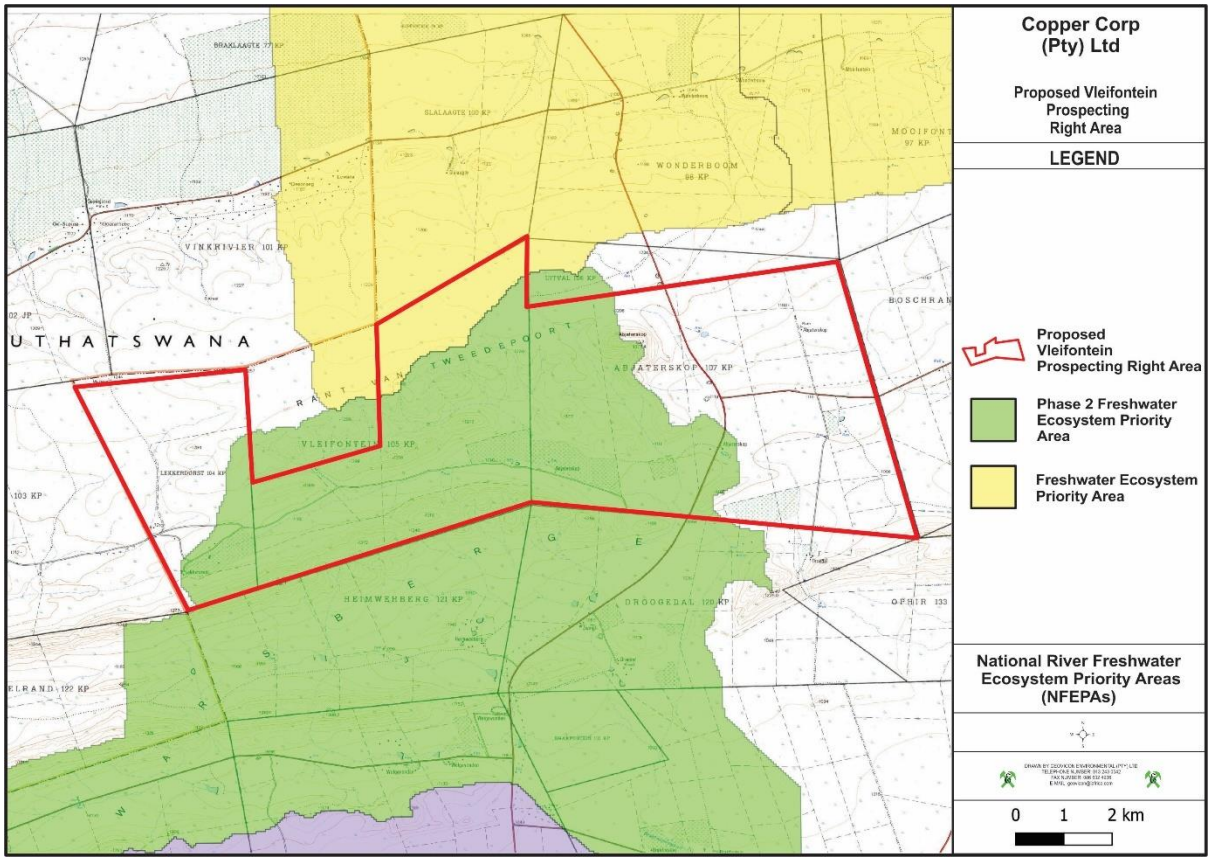


Figure 11: National River Freshwater Ecosystem Priority Areas in the vicinity of the proposed Vleifontein prospecting right area

According to the South African National Biodiversity Institute, GIS-based electronic application, 2018: National Biodiversity Assessment - National Wetlands Map 5, the identified prospecting area is situated in the vicinity of the following wetland type, namely an unchanneled valley bottom (Figure 12) falling into three different wetland vegetation types associated with each ecosystem type, namely the Central Bushveld Group 1 wetland vegetation type. the Central Bushveld Group 2 wetland vegetation type and the Central Bushveld Group 9 wetland vegetation type (Figure 13).

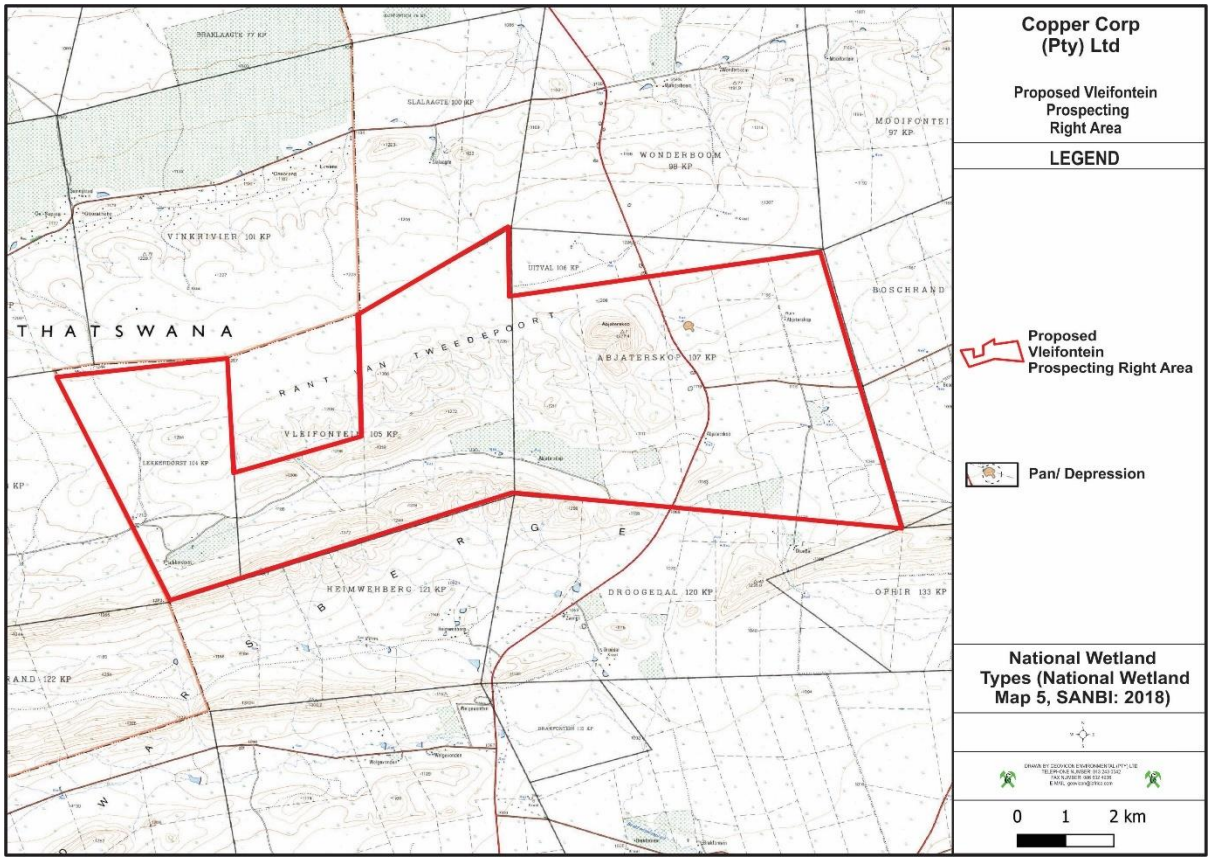


Figure 12: National Wetland Types in the vicinity of the proposed Vleifontein prospecting right area.

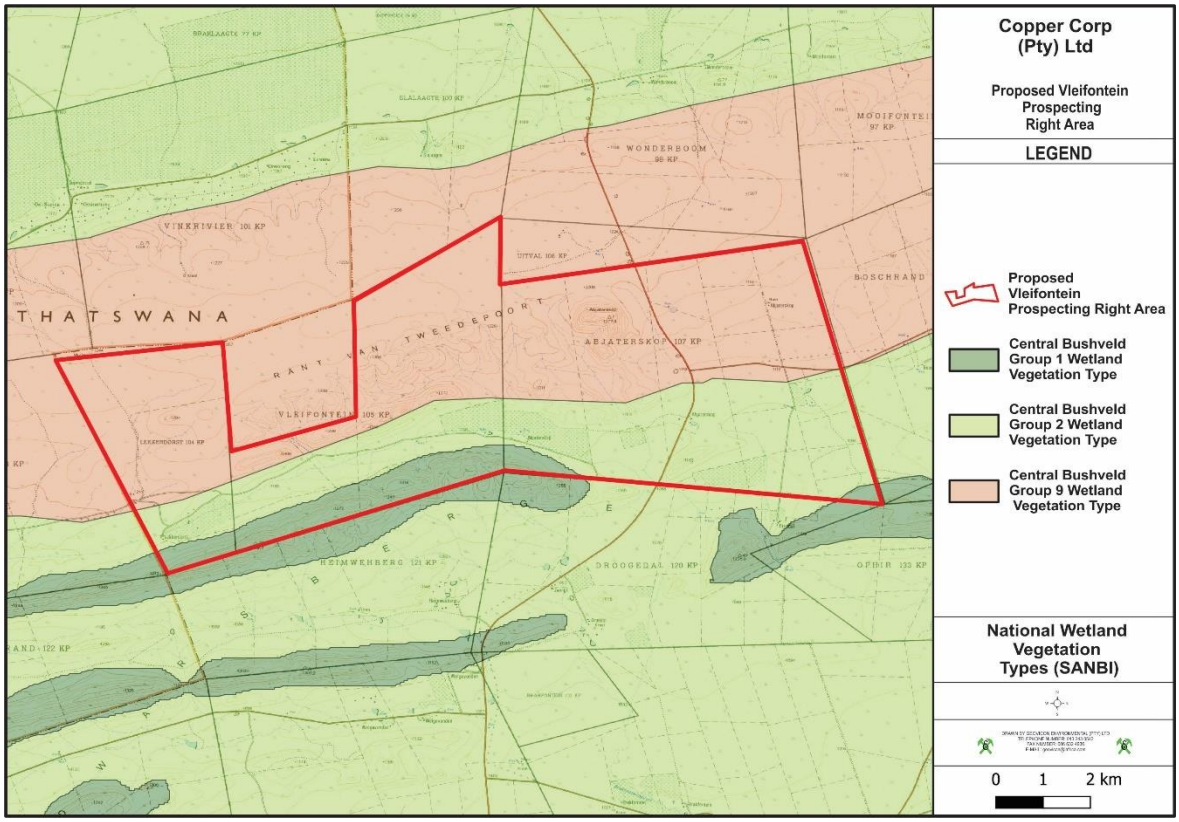


Figure 13: National Wetland Vegetation Types in the vicinity of the proposed Vleifontein prospecting right area.

The proposed Vleifontein prospecting area is situated in the vicinity of both terrestrial (Figure 14) and aquatic CBA and ESA areas (Figure 15). Table 12 provides a clear explanation of the terrestrial and aquatic critical biodiversity areas and ecological support areas found within the proposed Vleifontein prospecting area.

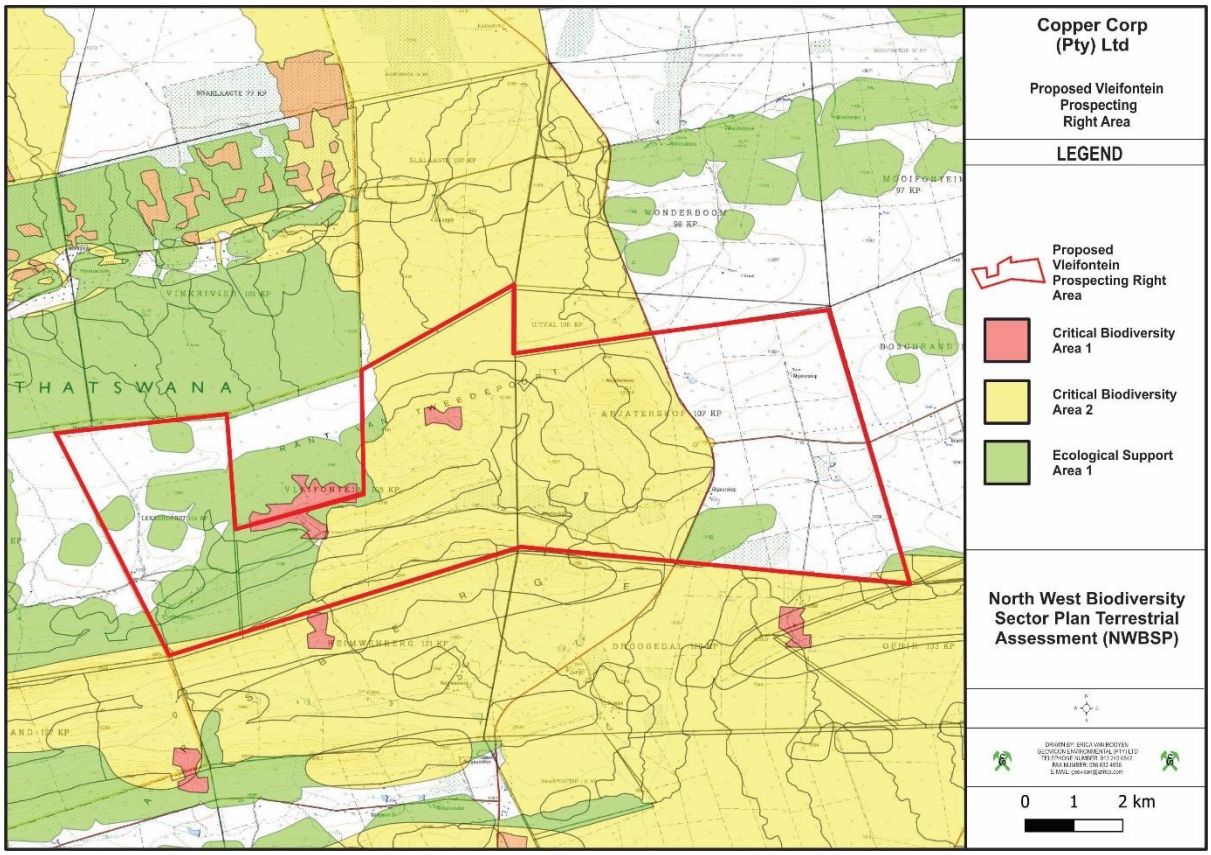


Figure 14: North West Biodiversity Sector Plan Terrestrial Assessment for the proposed Vleifontein prospecting right area.

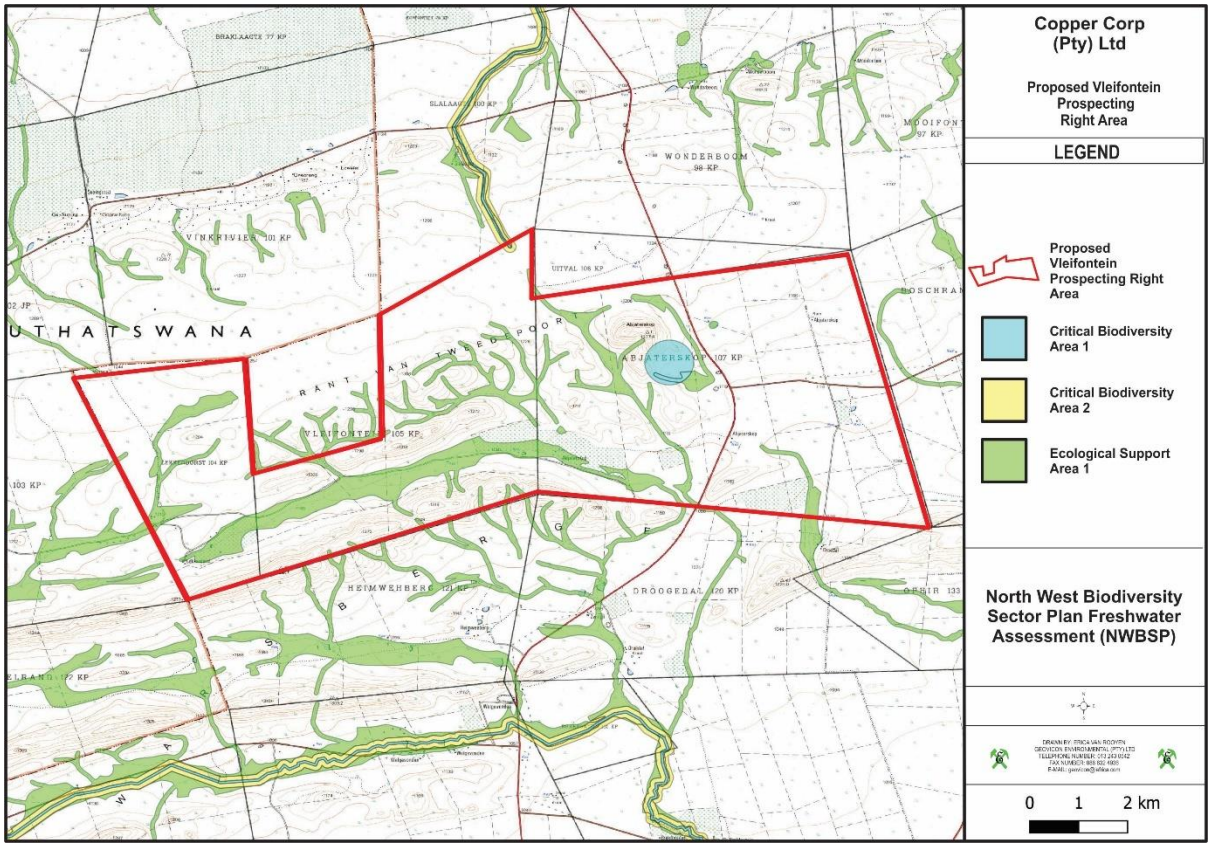


Figure 15: North West Biodiversity Sector Plan Freshwater Assessment for the proposed Vleifontein prospecting right area.

Table 12: North West biodiversity sector plan map code descriptions

Terrestrial Critical Biodiversity Area Level 1 - Map Code CBA 1	
Critical Patches: Ecosystem Status – Critically Endangered Ecosystems	Remaining patches larger than 3 ha of provincially Critically Endangered ecosystems (vegetation types), i.e., the amount of vegetation remaining intact (of these ecosystems) is less than the representation/biodiversity target, therefore all remaining patches of these vegetation units are of the highest conservation priority and further impacts on natural habitat should be avoided
Irreplaceable Sites	Planning units with high irreplaceability values based on the provincial MARXAN analysis, i.e., areas or sites that are mandatory if biodiversity targets are to be achieved
Critical Biodiversity Corridors Linkages	Critical linkages in the provincial biodiversity corridor network where existing conversion of natural landscapes to other land uses has severely restricted options for maintaining connectivity in the natural landscape. Critical linkages that are not in a natural state are categorised as ESA 2
Important Terrestrial Habitats: Expert Areas	Areas in the terrestrial environments less than 10 000 ha in extent identified by experts as being important for biodiversity conservation

Important Terrestrial Habitats: Kloofs	All medium to large kloofs identified as an important habitat for climate change adaptation
Aquatic Critical Biodiversity Areas Level 1 – Map Code CBA 1	
FEPA Rivers	All FEPA River lines (FEPA rivers, fish sanctuary and free-flowing rivers) buffered by 100 m as identified in NFEPA and modified by DWS National River Eco status Monitoring Program (REMP) and experts.
Important Habitats: Peat Wetlands	Peat wetlands as mapped by experts
Important Habitats: Dolomitic Eyes	Dolomitic eyes as mapped by experts
Aquatic Ecological Support Areas Level 1 and Level 2 – Map Code ESA1 if natural ESA2 if not natural	
FEPA Fish Catchments	Catchments supporting FEPA fish rivers
Wetland Clusters	Clusters of larger wetlands and pans and their collective buffer (500 m).
Peat Wetland Buffers	500 m buffer around peat wetlands
Dolomite Recharge Area	The karst landscape of central North West around which all major eyes emerge and based on topography is the most likely area for the dolomitic aquifer recharge zone

The proposed Vleifontein prospecting right area is situated in the vicinity of South African Protected Areas, namely the Madikwe Nature Reserve. Figure 16 provides a visual indication.

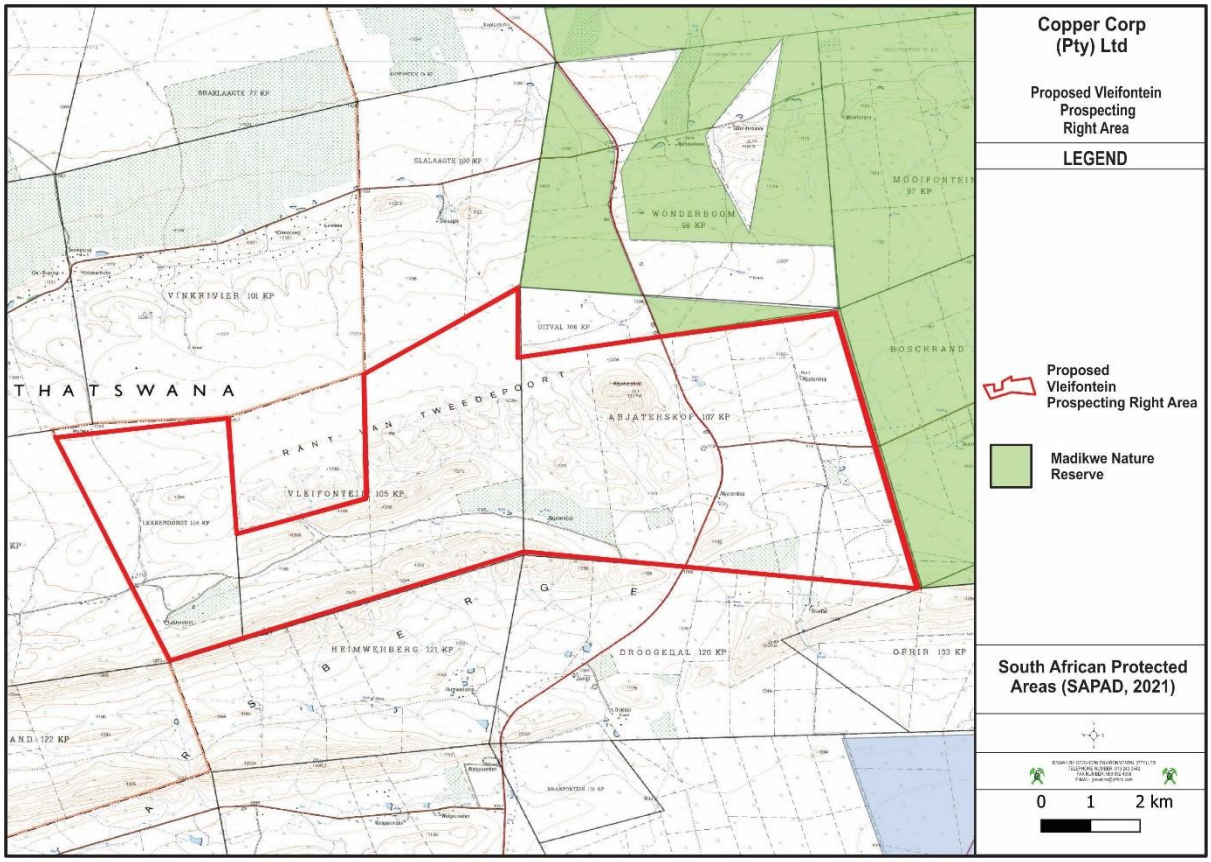


Figure 16: South African Protected Areas in the vicinity of the proposed Vleifontein prospecting area

5.3.11. Air Quality

Potentially air pollution from human activities may arise as a result of particulates entering the atmosphere. The sources of air pollution from human activities comprise of three broad categories i.e., stationary sources (agriculture, mining, quarrying, manufacturing, mineral products, industries and power generation), community sources (homes or buildings, municipal waste and sewage sludge incinerators, fireplaces, cooking facilities, laundry services and cleaning plants) and mobile sources combustion-engine vehicles and fugitive emissions from vehicle traffic). Air pollutants are generally classified into suspended particulate matter (dust, fumes, mists and smokes), gaseous pollutants (gases and vapours) and odours.

Assessment of the proposed prospecting right area has determined that all three categories of air pollution sources are found at the proposed area.

5.3.12. Noise

The proposed project area is predominantly a farming area. Noise from the area is mainly from farming activities with use of associated infrastructure and land use activities.

5.2.11 Socio-Economic Status

Ditsobotla Local Municipality is located within the Ngaka Modiri Molema district municipality, North West. The municipality has the following main industries that significantly to the local, provincial and national GDP, namely Agriculture; mining and quarrying; manufacturing; wholesale and retail trade; financial; insurance, real estate and business services.

5.2.11.1 Population density, growth and location

According to census 2011, Ramotshere Moiloa Local Municipality has a total population of 155 513 people, of which 99,6% are black African, with the other population groups making up the remaining 0,4%. The report showed that 5,0% people who are aged 20 years and older have completed primary school, 27,5% have some secondary education, 21,1% have completed matric and 6,4% have some form of higher education. The figures also showed that 20,7% have no form of schooling.

The 2016 community survey conducted by Statistics South Africa, indicate that Ramotshere Moiloa Local Municipality is increasingly under pressure due to population growth. According to statistic South Africa, in 2011, the total population in Ramotshere Moiloa was approximately 152 664 and in 2016 the population was estimated at 157 690.Overall the municipality experienced an annual population increase of 0.74% between 2011 and 2016.

96% of the municipality is black and Africans, followed by 2% Whites and 1% Coloured and 1% Indians. The proportion of Coloured people is insignificant at 0, 9% but have the highest growth rate since 2011 to 2016 at 60.38%.

A significant portion of the population of the municipality falls in the ages below 34 years, i.e., 64.6 % falls within this category. The high number of people who are young in the population contributes to the positive growth in the population. This growth requires the municipality to focus more on skills development and job creation.

In terms of education, the majority of the population of the municipality have some form of education with only 15.5% of the population have no schooling, while about 28.8% have matric and only 5.8% have higher education.

5.2.11.2. Major economic activities and sources of employment

Several economic sectors of the Ramotshere Moiloa Local Municipality have been identified as important, with the most profound being the agriculture, mining and retail trade sectors. These sectors are responsible for the majority of the injections into the local economy, and should be supported and seen as priority

In spite of Ramotshere Moiloa rural nature, the dominant economic activities in the municipal area is in its tertiary sector activities such as retail trade and services. The primary and secondary activities are not that prominent in the local economy. The dominant economic activities in the municipal area are crop and livestock farming and small mining operations of minerals.

SECTION SIX

ENVIRONMENTAL IMPACT ASSESSMENT

6. ENVIRONMENTAL IMPACT ASSESSMENT

6.1. ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOLLOWED

6.1.1. Approach to Environmental Impact Assessment

The term 'environment' is used in the broadest sense in an EIA.It covers the physical, biological, social, economic, cultural, historical, institutional and political environments.

An Environmental Impact Assessment is a good planning tool. It identifies the environmental consequences of a proposed project from the beginning and helps to ensure that the project, over its life cycle, will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

6.1.2. Environmental Impact Assessment Process Followed

Under Section 24 of the National Environmental Management Act (NEMA), the Minister promulgated the regulations pertaining to environmental impact assessments (EIA Regulations, 2014) under Government Notice No. 326 in Government Gazette 38282 of 4 December 2014. These EIA regulations repealed the 2010 EIA regulations and therefore any process relating to environmental authorisations must be undertaken under the EIA Regulations, 2014.

Chapter 4 of the EIA Regulations, 2014 deals with the provisions for application for environmental authorisation. In view of the above, Copper Corp (Pty) Limited is obliged to comply with provisions of Chapter 4 for the intended environmental authorisation application for the activities (listed activities) within the proposed project.

Part 2 of chapter 4 of the EIA Regulations, 2014 contemplate process to be undertaken for the application for environmental authorisation for the proposed project, which is the BAR process. The process to be followed is describe below.

6.1.2.1. Pre-application consultation with the Competent Authority

In terms of section 24D (1) of the National Environmental Management Act, 1998 (Act 107 of 1998), the Minister responsible for mineral resources is the competent authority for environmental matters relating to mining and associated activities. In view of the above, the application for the environmental authorisation for the proposed project was submitted to the Department of Mineral Resources and Energy (DMRE), North West Regional Office for their consideration and decision making.

6.1.2.2. BAR Phase

In compliance with Regulation 19 of the EIA Regulations, 2014, the draft and final BAR and EMPr will be submitted to the competent authority within 90 days after the acknowledgement of the environmental authorisation application.

As part of the public participation, the draft BAR and EMPr is made available to the competent authority, potential and registered interested and affected parties for their comment for a period of 30 days during the EIA phase.

6.1.2.3. Information Gathering

Environmental baseline data has been obtained via desktop studies, pertaining to surface water, geohydrological data, topographical analyses, soil surveys, vegetation surveys, wetland surveys and geological conditions. The data accumulated and analysed is sufficient to gain a baseline indication of the present state of the environment. The use of this baseline study for impact assessments is thus justified and reliable conclusions could be made.

6.1.2.4. Decision on the BAR application

In compliance with Regulation 20 of the EIA Regulations, 2014, the competent authority will within 107 days of receipt of the final BAR and EMPr grant or refuse the environmental authorisation.

6.2. ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

The following prediction and evaluation of impacts is based on the proposed Vleifontein prospecting right area and associated activities.

The evaluation distinguishes between significantly adverse and beneficial impacts and allocates significance against national regulations, standards and quality objectives governing:

- Health & Safety;
- Protection of Environmentally Sensitive Areas;
- Land use; and
- Pollution levels.

Irreversible impacts are also identified. See Table 14 for the results.

The significance of the impacts is determined through the consideration of the following criteria:

Probability	:	likelihood of the impact occurring
Area (Extent)	:	the extent over which the impact will be experienced.
Duration	:	the period over which the impact will be experienced.
Intensity	:	the degree to which the impact affects the health and welfare of humans and the environment (includes the consideration of unknown risks, reversibility of the impact, violation of laws, precedents for future actions and cumulative effects).

Table 13: The above criteria are expressed for each impact in tabular form according to the following definitions:

Probability	Definition
Low	There is a slight possibility (0 – 30%) that the impact will occur.
Medium	There is a 30 –70% possibility that the impact will occur.
High	The impact is definitely expected to occur (70% +) or is already occurring.
Area (Extent)	**Definition**
Small	0 – 40 ha
Medium	40 – 200 ha
Large	200 + ha
Duration	**Definition**
Short	0–5 years
Medium	5–50 years
Long	51–200 years

Permanent	200+years

Intensity	Definition
Low	Does not contravene any laws. Is within environmental standards or objectives. Will not constitute a precedent for future actions. Is reversible. Will have a slight impact on the health and welfare of humans or the environment.
Medium	Does not contravene any laws. Will not constitute a precedent for future actions. Is not within environmental standards or objectives. Is not irreversible. Will have a moderate impact on the health and welfare of humans or the environment.
High	Contravene laws. May constitute a precedent for future actions. Is not within environmental standards or objectives. Is irreversible. Will have a significant impact on the health and welfare of humans or the environment.

Significance and Risk Category	Definition
Negligible	The impact/risk is insubstantial and does not require management
Low	The impact/risk is of little importance, but requires management
Medium	The impact/risk is important; management is required to reduce negative impacts to acceptable levels
High	The impact/risk is of great importance, negative impacts could render options or the entire project unacceptable if they cannot be reduced or counteracted by significantly positive impacts, and management of these impacts is essential
Positive (No risk identified)	The impact, although having no significant negative impacts, may in fact contribute to environmental or economical health

6.3. RESULTS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

6.3.1. Assessment of the Vleifontein prospecting area impacts/risks

Table 14: Results of the Environmental Impact Assessment for Vleifontein prospecting right area.

6.3.1.1. Construction Phase

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
PRE-CONSTRUCTION AND CONSTRUCTION PHASES							
Site Establishment: Establishment of the access (tracks) to the prospecting site, Establishment of the campsite, Site physical surveying and pegging of drilling sites							
The establishment of access, campsite and the surveying with pegging of the drilling sites may result in the stripping of soils if the site establishment of not properly conducted. This may result in the loss of soils and erosion that may render the area unusable. During site establishment, machinery and vehicles used for the prospecting operation may result in hydrocarbon leakages, which may result in the contamination of the soils within the access tracks, campsite and drilling sites.	Soil/Land capability	Without mitigation					Establishment of the site will be undertaken according to the prospecting method statement. No soil stripping will be allowed during site establishment. Ensure minimal disturbance of soil when conducting geophysical surveys and geological mapping (if necessary). Any area that may result into the disturbance of the soils must be rehabilitated immediately on discovery. Machinery to be used for the operation will be of good working conditions. Any hydrocarbon spill from the site establishment will be remediated as soon as possible.
		S	L	S	M	M	
		With mitigation					
		S	L	S	L	L	
	Land use	Without mitigation					

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
PRE-CONSTRUCTION AND CONSTRUCTION PHASES							
Current land use over the area to be used for site establishment will cease completely. This may have an impact on the land owners' livelihood should they not be able to use the land. Drilling activities may infringe the livelihood and operations of activities occurring within and immediately adjacent the prospecting right area.		S	M	S	M	M	Use sites that are unused and that are in the degraded state for the proposed development. This will be done in agreement with the land owner. The sitting of the boreholes will be conducted to ensure that rocky ridges, sensitive grass lands, indigenous trees and shrubs, sites of geological importance and farmlands actively used for crop farming are avoided. No-go zones will be instituted around existing infrastructure/facilities and operations occurring within and immediately adjacent to the prospecting right area. No prospecting activities will be undertaken within the instituted no-go zones.
		With mitigation					
		S	L	S	L	L	
The establishment of access and the surveying with pegging of the drilling sites may result in wetland destruction and loss of habitat if the site establishment is not properly conducted.	Sensitive landscape	Without mitigation					Construction activities will be limited to be more than hundred meters from the edge of streams and wetlands. Construction activities will, as far as possible, not be undertaken within the sensitive areas. Should prospecting activities be planned within sensitive areas, the relevant environmental investigations will be conducted in order to define already disturbed areas, for drilling activities.
		S	M	S	M	M	
		With mitigation					
		S	L	S	L	L	
	Natural vegetation	Without mitigation					Use sites with most disturbed vegetation cover for the development.
		S	L	S	L	L	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
PRE-CONSTRUCTION AND CONSTRUCTION PHASES							
The establishment of the site (access, campsite and drilling sites) may result in the removal of vegetation cover if the establishment is not done correctly. This may render the land unusable to the land owners after completion of the area. Veld fires can manifest especially during the winter months from the establishment of the site (access, campsite and drilling sites). If not controlled, the fires can destroy large areas of veld and could result in the loss of vegetation to landowners and surrounding land owners.		With mitigation					No strip of topsoil and vegetation will be allowed during site establishment. Ensure minimal disturbance of vegetation when conducting geophysical surveys and geological mapping. Any area that may result into the disturbance of the vegetation cover must be rehabilitated immediately on discovery. Pictures of possible plant species of conservation concern that may be present in the prospecting right area will be made available to the drilling crew for easy identification and avoidance. The making of fire will be strictly prohibited. Firefighting equipment will always be kept at the prospecting site ready, in a good working condition and at an accessible location. Correct fire extinguishers will be used to extinguish the fire. Note that no water on electrical and liquid based fires will be used. The employees will be trained on dealing with fire situation. First aid equipment will be made available at all times. If the fire seems to go out of control, the Fire Brigade from the nearby town will be contacted. Vleifontein prospecting right project will establish a working agreement with the Fire Brigade from the nearby town to make themselves available at any time in a case fire are out of control.
		S	L	S	L	N	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
PRE-CONSTRUCTION AND CONSTRUCTION PHASES							
							No person shall place, throw or leave, or cause or permit to be placed, thrown or left, any naked light or flame or any burning lighting torch, match, cigarette, tobacco, paper or other burning material on or near any combustible material or inflammable substance where this may cause danger from fire or explosion; No waste material of a combustible nature shall be stored anywhere in quantity sufficient to create a fire hazard; No welding, flame-cutting or flame-heating shall take place unless adequate means are immediately available for extinguishing any fire which may result from such operation; On completion of any welding, flame-cutting or flame-heating, an examination shall be carried out by a competent person to ensure that no fire will result from such operation; All machinery shall be so constructed, installed, operated and maintained as to prevent as far as practical, dangerous heating.
Animal burrows and habitats remaining within the proposed development site may be destroyed during construction. This may result in the migration of remaining animal life away from the affected areas.	Animal Life	Without mitigation					Establishment of the site will be undertaken according to the prospecting method statement. No soil stripping will be allowed during site establishment. Any area that may result into the disturbance of the soils must be rehabilitated immediately on discovery.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
PRE-CONSTRUCTION AND CONSTRUCTION PHASES							
Poaching of wild animals and livestock by the labourers will result in the loss of wild life and loss of livestock to the land owner.							Use sites with most degraded environment for the site development. Poaching will be prohibited at the prospecting site. Before the drilling activities can commence, a biodiversity specialist must do a site inspection on the proposed marked drilling sites (proposed boreholes) to assess if there are no animal burrows and habitats. If any burrows or habitat exist, the location of the proposed boreholes must be changed.
Exposure of soils during construction by the stripping of vegetation and soils may cause erosion, which may lead to increased silt loads in surface water runoff. This may result in the contamination of the clean water environment. Waste generated from the site may result in the contamination of surface and ground water should not management of such waste be undertaken.	Surface and Ground Water	Without mitigation					Site establishment will not be undertaken within sensitive landscapes. These areas will be avoided. A distance of 100 meters will be created between the sites and the sensitive landscapes. The applicant must also apply for a GA before drilling within 500m of nearby streams and/or wetlands. Avoid stripping of areas within the construction sites. Rehabilitate areas that may have been mistakenly stripped. Storm water upslope of the campsite and drill sites should be diverted around these areas. Proper waste management facilities will be put in place at the campsite and drilling site. Any hydrocarbon spill from the site establishment will be remediated as soon as possible.
		S	L	S	M	M	
		With mitigation					
		S	L	S	L	L	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
PRE-CONSTRUCTION AND CONSTRUCTION PHASES							
Construction activities during the establishment of the site will include material loading and hauling. These activities will result in the mobilisation of particulates that will migrate away from the site to the nearby local residents. This will be a nuisance to the communities and will result in aesthetic impacts associated with fugitive dust emissions. On-site dust fall may have health and nuisance implications to employees at the existing offices.	Air Quality	Without mitigation					Ensure that source specific management measures for Vleifontein prospecting area are complied with.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	
The noise level generated from the construction activities may exceed the SANS 10103 Levels for Residential areas and may exceed the maximum rating levels for ambient noise indoors. This may have an impact in the surrounding residents and employees using/delivering the machinery.	Noise	Without mitigation					Ensure that proper management measures as well as technical changes are undertaken to reduce the impacts on surrounding residents and employees. This include ensuring that less noisy equipment is used, that equipment is kept in good working order and that the equipment must be fitted with correct and appropriate noise abatement measures and where possible use white-noise generators instead of tonal reverse alarms on heavy vehicles operating on roads.
		S	L	S	L	L	
		Without mitigation					
		S	L	S	L	N	
The activities undertaken during construction and associated infrastructure will be visible from the nearby roads and properties. However, due to the undulating topography, visibility for the most part will most probably be restricted to short distances.	Visual Aspects	Without mitigation					Inform the land owner on the type of machinery and equipment to be used at the prospecting site.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
PRE-CONSTRUCTION AND CONSTRUCTION PHASES							
The site may be located in close proximity to a heritage site and may result in the destruction of the identified heritage site.	Sites of Archaeological and Cultural Importance	Without mitigation					The establishment of the construction infrastructure complex will be such that the development is always away from the any heritage sites. A buffer of more than fifty meters will be created between any grave yards and the proposed site development. A management plan will be drafted for the sustainable preservation of the grave yard should graveyards be identified on site. Any grave site must have access for descendants.
		S	M	S	H	H	
		With mitigation					
		S	L	S	L	L	
The commencement of the proposed area may result in an influx of 'outsiders' seeking jobs, which may be caused by increase in local unemployment levels. This may result in the have potential increase in crime. It must however be noted that prospecting activities would unlikely attract job seeker due to its small nature of its scale.	Socio economic aspects	Without mitigation					Recruitment will not be undertaken on site.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	

6.3.1.2. Operational Phase

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
OPERATIONAL PHASE							
Drilling and rehabilitation of the exploration boreholes							
Topsoil removal, storage and replacement during the excavation of the sumps will result. This will result in the disruption of the soils profile.	Soils	Without mitigation					Ensure that topsoil is properly stored, away from the streams and drainage areas. The soils must be used for the backfilling and rehabilitation of the sumps. The rehabilitated sump must be seeded with recommended seed mix.
		S	M	S	L	L	
		With mitigation					
		S	L	S	L	N	
The use of vehicles during the siting, pegging and drilling of the exploration boreholes may result in the spillages of hydrocarbon liquids from the vehicles and machinery. This will result in the contamination of the vegetation cover and soils. The material removed from the drilling exercises will contain carbonaceous material, which has a potential for pollution should it be allowed stay for a prolonged period at the drilling site. The above material, if not properly managed, may result in the contamination of the surrounding soils and vegetation cover, which may render the land not usable after the backfilling operation.	Natural Vegetation and Soils	Without mitigation					Ensure that the drilling of the exploration boreholes is done in such a manner that the environment is protected from probable spillages and contamination by carbonaceous material. All boreholes and sumps will be rehabilitated to pre-drilling conditions. Tarpaulins will be placed on the ground to prevent oil, grease, hydraulic fluid and diesel spills during emergency repairs. All oil spills will be remedied using approved methodologies. The contaminated soils will be removed and disposed of at a licensed waste disposal facility. Pictures of possible plant species of conservation concern that may be present in the prospecting right area will be made available to the drilling crew for easy identification and avoidance.
		S	M	S	M	M	
		With mitigation					
		S	L	S	L	L	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
OPERATIONAL PHASE							
During drilling activities, veld fires can manifest especially during the winter months from the drilling sites and their campsite. If not controlled, the fires can destroy large areas of veld and could result in the loss of vegetation to landowners and surrounding land owners.							All waste generated from the drilling sites and the campsite will be collected in proper receptacles and removed top registered disposal facilities e.g., sewage treatment plant, solid waste disposal site or hydrocarbon recycling or treatment facilities. Before the drilling activities can commence, a biodiversity specialist must do a site inspection on the proposed marked drilling sites (proposed boreholes) to assess if there are no protected and/or critical natural vegetation. If any protected and/or critical natural vegetation occurs, the location of the proposed boreholes must be changed. No trees or shrubs will be felled or damaged for the purpose of obtaining firewood. The making of fire will be strictly prohibited. Firefighting equipment will always be kept at the prospecting site ready, in a good working condition and at an accessible location. Correct fire extinguishers will be used to extinguish the fire. Note that no water on electrical and liquid based fires will be used. The employees will be trained on dealing with fire situation. First aid equipment will be made available at all times. If the fire seems to go out of control, the Fire Brigade from the nearby town will be contacted. Vleifontein prospecting right project will establish a working agreement with the Fire Brigade

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
OPERATIONAL PHASE							
							from the nearby town to make themselves available at any time in a case fire are out of control. No person shall place, throw or leave, or cause or permit to be placed, thrown or left, any naked light or flame or any burning lighting torch, match, cigarette, tobacco, paper or other burning material on or near any combustible material or inflammable substance where this may cause danger from fire or explosion; No waste material of a combustible nature shall be stored anywhere in quantity sufficient to create a fire hazard; No welding, flame-cutting or flame-heating shall take place unless adequate means are immediately available for extinguishing any fire which may result from such operation; On completion of any welding, flame-cutting or flame-heating, an examination shall be carried out by a competent person to ensure that no fire will result from such operation; All machinery shall be so constructed, installed, operated and maintained as to prevent as far as practical, dangerous heating.
Animal burrows and habitats will be destroyed by the preparation of the backfilling sites. This will further result in the migration of animals away from these areas of	Animal Life	Without mitigation					
		S	L	S	L	L	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
OPERATIONAL PHASE							
disturbance. It must however be noted that no significant amount of animal life exists due to the agricultural activities currently undertaken at the proposed prospecting sites.		Without mitigation					The rehabilitation of the disturbed areas must be conducted such that the rehabilitated areas will encourage the migration of animals back into the rehabilitated areas. Poaching of wild animals and livestock will be prohibited. Before the drilling activities can commence, a biodiversity specialist must do a site inspection on the proposed marked drilling sites (proposed boreholes) to assess if there are no animal burrows and habitats. If any burrows or habitat exist, the location of the proposed boreholes must be changed.
		S	L	S	L	N	
Current land use activities over the area to be used for drilling and rehabilitation of the exploration boreholes activities may need to cease during the undertaking of the prospecting activities. This may have an impact on the land owners' livelihood should they not be able to use the land for the current land uses. Drilling activities may infringe the livelihood and operations of activities occurring within and immediately adjacent the prospecting right area.	Land use	With mitigation					Use sites that are unused and that are in the degraded state for the proposed development. This will be done in agreement with the land owner. The siting of the boreholes will be conducted to ensure that rocky ridges, sensitive grasslands, indigenous trees and shrubs, and sites of geological importance are avoided. No-go zones will be instituted around existing infrastructure/facilities and operations occurring within and immediately adjacent to the prospecting right area. No prospecting activities will be undertaken within the instituted no-go zones.
		S	M	S	M	M	
		Without mitigation					
		S	L	S	L	L	
	Sensitive landscape	Without mitigation					

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
OPERATIONAL PHASE							
Drilling activities may result in wetland destruction and loss of habitat if the site establishment is not properly conducted.		S	M	S	M	M	Operation of the drilling site will be limited to be more than hundred meters from the edge of streams and wetlands. The applicant must also apply for a GA before drilling within 500m of nearby streams and/or wetlands. Drilling activities will be limited to be more than hundred meters from the edge of streams and wetlands. Drilling activities will, as far as possible, not be undertaken within the sensitive areas. Should prospecting activities be planned within sensitive areas, the relevant environmental investigations will be conducted in order to define already disturbed areas, for drilling activities.
		With mitigation					
		S	L	S	L	L	
The drilling operations may result in the generation of surface water runoff contaminated with drilling muds and cuttings should spillages occur. The sedimentation and possible contamination with carbonaceous material will have negative impacts on the surrounding clean water environment. These will cause an increase in the turbidity and will decrease acidity of the water in the streams, which will affect the aquatic habitat of the wetland, hence important habitats may be lost.	Surface Water	Without mitigation					No prospecting operations will be undertaken within 100 metres from the nearby streams and wetland areas. The applicant must also apply for a GA before drilling within 500m of nearby streams and/or wetlands. The sumps will be excavated for the collection mud and excess water from the drilling sites. The sump will be sized such that it will be able to contain the water and mud that will be generated during the prospecting operation. Storm water generated around the drilling site will be diverted away to the clean water environment. No concrete mixing and vehicle maintenance will
		S	L	S	M	L	
		With mitigation					
		S	L	S	L	L	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
OPERATIONAL PHASE							
							be allowed on site. All hydrocarbons will be stored on protected storage areas away from the streams.
The prospecting operations will require the drilling of boreholes. The boreholes may result in the drawdown, which may affect the yield to the surrounding groundwater users. Material used for backfilling may leach pollutants that will result in the pollution of the surrounding groundwater regime. This may even spread beyond the backfilling site via plume migration.	Groundwater	Without mitigation					Ensure that the land owners' borehole yield is observed during the drilling operation. Should it be proven that the operation is indeed affecting the quantity and quality of groundwater available to users and surrounding water resources, the affected parties must be compensated.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	
The prospecting operation will require vehicular movement. This will result in the generation of dust by movement of vehicles and due to blowing winds. Vehicles and machinery will also generate diesel or petrol fumes. Generated dust will migrate towards the predominant wind direction and may settle on surrounding properties including nearby vegetation.	Air Quality	Without mitigation					Dust suppression must be conducted during the operational phase of the area. Correct speed will be maintained at the proposed area site. Vehicle maintenance must be conducted regularly to avoid excessive diesel fumes.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	
	Noise	Without mitigation					

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
OPERATIONAL PHASE							
Noise generated from prospecting operations activities may add to the current noise levels. This may have impacts on surrounding property owners and occupiers.		S	L	S	M	L	Ensure that proper management measures as well as technical changes are undertaken to reduce the impacts on surrounding residents and employees. This include ensuring that less noisy equipment is use, that equipment is kept in good working order and that the equipment must be fitted with correct and appropriate noise abatement measures and where possible use white-noise generators instead of tonal reverse alarms on heavy vehicles operating on roads. Correct speed will be maintained at the proposed area site. Limit operation of machinery and vehicle movement between sunrise and sunset.
		With mitigation					
		S	L	S	L	L	
The drill rigs and towers used during the drilling operations will be visible from the nearby residents and properties.	Visual Aspects	Without mitigation					Ensure that the period used for the drill rigs is optimised to ensure that the drill rigs are moved from one site to another over short periods.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	
Operation may affect the day-to-day operation of the land owners hence result in direct impact on their livelihood.	Socio economic aspects	Without Mitigation					Ensure that all safety measures (EMPR) are implemented to prevent the impacts on the property owners. Ensure that negotiations on compensation are undertaken before the drilling programme can commence. This will include any other
		S	L	S	L	L	
		With Mitigation					

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
OPERATIONAL PHASE							
		S	L	S	L	N	conditions that the landowner may deem necessary for the prospecting operation.
Operation will result in the employment of locals and support on local businesses.	Socio economic aspects	Positive					The applicant will ensure that as far as possible locals will be used during the operation of the prospecting area.
The drilling operation may result in the destruction of graves and any other heritage sites during operational phase of the area.	Sites of archaeological and cultural importance	Without Mitigation					Locate exploration borehole more than one hundred meters from the identified heritage sites. Should any cultural or heritage materials be identified, these areas will be demarcated and treated as no-go areas during the prospecting activities. Detailed heritage studies would then be undertaken if it is deemed that these sites would be affected by the prospecting activities. Any finds will be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA. Local museums as well as the South African Heritage Resource Agency (SAHRA) will be informed if any artefacts are uncovered in the affected area. The prospecting workforce will be made aware of the necessity of reporting any possible historical or archaeological finds to the ECO so that appropriate action can be taken. Any discovered artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from the South African Heritage
		S	M	S	H	H	
		With Mitigation					
		S	S	S	L	L	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
OPERATIONAL PHASE							
							Resources Association (SAHRA) should the proposed site affect any world heritage sites or if any heritage sites are to be destroyed or altered.

6.3.1.3. Decommissioning and Closure Phases

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
DECOMMISSIONING AND CLOSURE PHASES							
Decommissioning of prospecting site (Site Rehabilitation)							
The removal of the campsite equipment and the rehabilitation of the drilling sites and associated access infrastructure will result in the affected soil and land use being restored. This will also result in the resumption of the use of the land since the infrastructure would have been removed.	Soils, Land Capability and Land Use	Positive impact					Ensure that rehabilitation is conducted in accordance with a rehabilitation method statement approved by the mine management. See description of the rehabilitation plan and management actions in the EMPr. Ensure that contamination of the rehabilitate area by carbonaceous material and hydrocarbon liquids are prevented.
Positive impacts will result due to the reduction in areas of disturbance and the return of land use of the affected areas and making available an area that was covered by the campsite and drilling sites.	Land Use	Positive impact					
The use of vehicles/machinery during the rehabilitation of the exploration sites may result compaction of soils and in the spillages of	Soils and Natural Vegetation	Without mitigation					
		S	M	S	M	M	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
DECOMMISSIONING AND CLOSURE PHASES							
hydrocarbon liquids from the vehicles and machinery. This will result in the contamination and destruction of the vegetation cover and soils.		With mitigation					Ensure that the rehabilitation work is done in such a manner that the environment is protected from probable spillages and contamination by carbonaceous material. All boreholes and sumps will be rehabilitated to pre-drilling conditions. Tarpaulins will be placed on the ground to prevent oil, grease, hydraulic fluid and diesel spills during emergency repairs. All oil spills will be remedied using approved methodologies. The contaminated soils will be removed and disposed of at a licensed waste disposal facility. All waste generated from the rehabilitation sites will be collected in proper receptacles and removed to registered disposal facilities e.g., sewage treatment plant, sold waste disposal site or hydrocarbon recycling or treatment facilities. Ensure that there is no infestation of alien invasive plants.
		S	L	S	L	L	
During the decommissioning and closure phases equipment will be removed, stockpiled soils will be used for rehabilitation, remaining sumps will be backfilled, levelled, topsoiled and the area re-seeded. During the process of rehabilitation surface water runoff from the rehabilitation site	Surface Water	Without mitigation					Ensure that water leaving the site do not have elevated silt load. Ensure that the rehabilitated areas are free draining and that water from these areas is clean.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	

NATURE OF THE IMPACT	ENVIRONMENTAL ASPECT	IMPACT ASSESSMENT					MITIGATION MEASURES
		E	P	D	I	S	
DECOMMISSIONING AND CLOSURE PHASES							
may have elevated silt load, which may cause pollution of the nearby water environment.							
Rehabilitation and removal of the prospecting sites and equipment will require vehicular movement. This will result in the generation of dust by movement of vehicles and due to blowing winds. Vehicles and machinery will also be generated diesel or petrol fumes. Generated dust will migrate towards the predominant wind direction and may settle on surrounding properties including nearby vegetation.	Air Quality	Without mitigation					Dust suppression must be conducted during the decommissioning phase of the area whenever excessive dust is generated. Correct speed will be maintained at the proposed area rehabilitation sites. Vehicle maintenance must be conducted regularly to avoid excessive diesel fumes.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	
Noise will be generated during the removal of equipment and rehabilitation of the sites. This noise is not expected to exceed occupational noise limits and will be short lived.	Noise	Without mitigation					Where necessary, provide employees with ear plugs and employees must be instructed to use the ear plugs. Ensure that equipment is well maintained and fitted with the correct and appropriate noise abatement measures.
		S	L	S	L	L	
		With mitigation					
		S	L	S	L	N	

6.4. SUMMARY OF SPECIALIST REPORTS

For this basic assessment report, only the desktop study was conducted hence no specialist reports are summarized.

6.5. ENVIRONMENTAL IMPACT STATEMENT

Copper Corp (Pty) Limited has applied for a prospecting right over the Vleifontein prospecting area. The prospecting operation will involve the systematic removal of copper and iron ore. The prospecting operation will involve the exploration for the above-mentioned minerals within the prospecting right area. Diamond core drilling will be used or the exploration and a campsite will be established on site. Each drilling site will have an access route in the form of a track and a sump for the collection of waste water generated during the drilling operation.

6.5.1. Description of affected environment

The proposed project is situated within the Ramotshere Moiloa Local Municipality situated in an area characterised by elevated undulating plateau with streams such as the Brakfonteinspruit and the Segakwane River. A variety of soil types were identified within the project area, which include recharge, interflow and responsive soils. The land uses over the project area correspond to the soils found in the area and include mainly agricultural activities (crop production and grazing).

6.5.2. Summary of key findings of the environmental impact assessment

During the proposed prospecting operation impacts may occur on soils, natural vegetation, surface water, groundwater, sensitive landscapes, air quality, noise, visual aspects, and sites of archaeological and cultural importance should the prospecting method statement not be adhered to. Alternatives considered for the location campsite and drilling sites has shown that the selected locations would be the most favourable. Copper Corp (Pty) Limited will undertake measures to ensure that the identified impacts are minimised. Assessment of the impacts with the proposed mitigation measures has shown the significance of the impacts on all affected environmental aspects to be reduced from low and negligible significance.

Land use will not change. Several landowners and land occupiers within the proposed area may be affected although on a temporary basis due to the need to access the sites and establishment and use of the campsite. Measures such as safety along the roads and dust suppression will be undertaken to ensure that the impacts on the land owners and land occupiers are minimised.

Assessment of the vegetation within the footprint (proposed boreholes) of the development area has shown limited presence of natural vegetation.

Storm water runoff from the dirty water areas of the drilling sites, its associated surface infrastructure (campsite) may have a detrimental impact on the surrounding water environment should this water be released to the environment. In order to prevent the occurrence of the above-mentioned impacts, dirty water collection sump will be used to collect all dirty water from the drilling sites. The water collected from the sump will be re-used for dust suppression, evaporated and the sump will be rehabilitated once the drilling is finished. Sediments will be created from the site during the construction, operational and decommissioning phase, which may impact negatively on the surrounding water environment, but will be treated should they contain hydrocarbon waste.

All workers will be housed in the campsite to be established on site. The employees will be given strict instruction not to undertake activities that will affect the environment and that may have an impact on the landowner. Waste generated from the site will be collected in proper receptacle and disposed of in registered waste disposal sites.

6.5.3. Final Master Layout Plan

The final maps showing the layouts of the proposed area will be submitted to the DMRE on granting of the prospecting project. The map will be developed to superimpose the proposed prospecting area together and associated infrastructure with the environmental sensitivities within the proposed area site, however a proposed draft prospecting layout plan is included as figure 17.

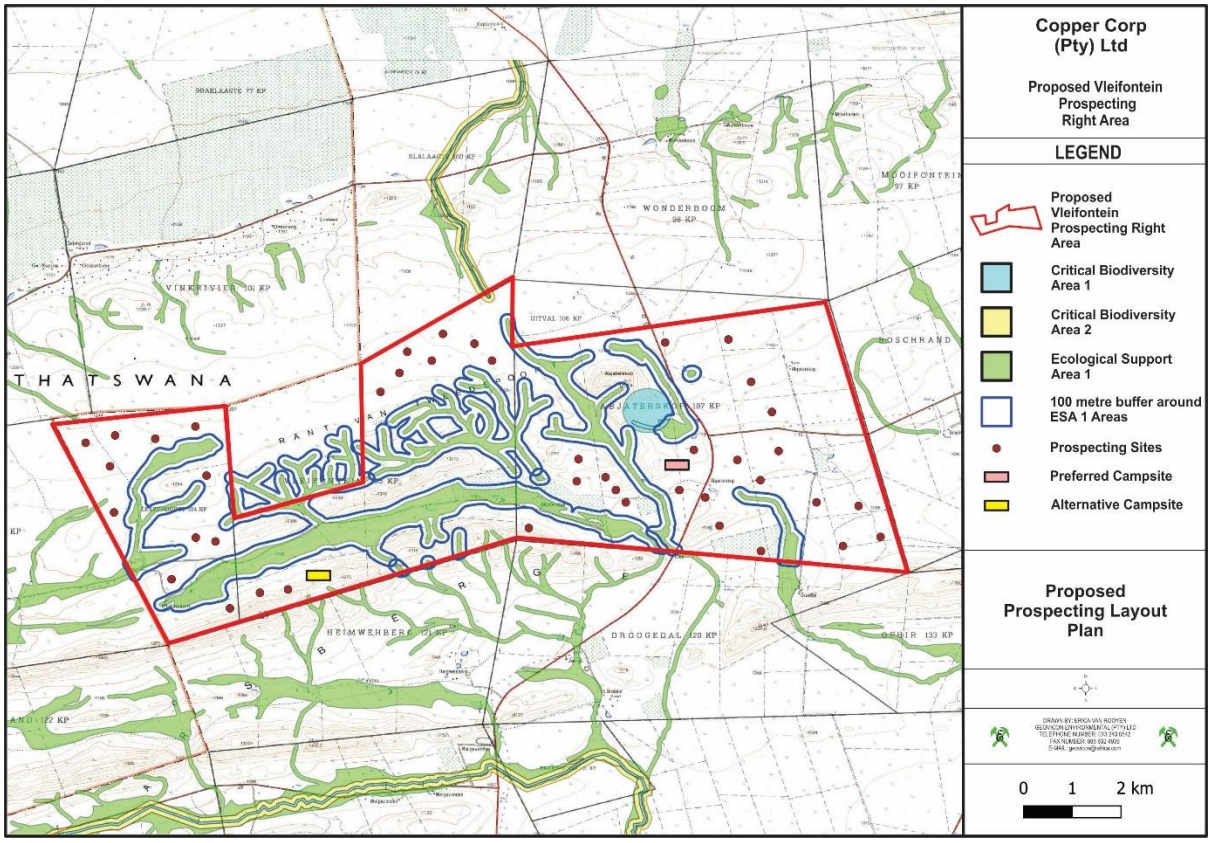


Figure 17: Proposed Prospecting Layout Plan for the proposed Vleifontein prospecting area

6.6. ASPECTS FOR INCLUSION AS CONDITIONS OF THE ENVIRONMENTAL AUTHORISATION

In authorising the proposed Vleifontein prospecting project; the following conditions form part of the environmental authorisation:

- Copper Corp (Pty) Limited may not alter the location of any of the project activities included in this environmental impact assessment without obtaining the required environmental authorisation to do so under NEMA.
- Copper Corp (Pty) Limited will not undertake any new activity/ies that was not part of this environmental impact assessment and that will trigger a need for an environmental authorisation without proper authorisation.
- The EMPr must be implemented fully at all stages of the proposed project
- Copper Corp (Pty) Limited must limit night-time operations. This would be relevant for all work taking place at night within 150 m from the closest receptors in this community. If night work is conducted, such must be conducted in agreement with the land owners and affected parties (lawful land occupier and labours).

6.7. DESCRIPTION OF ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

The EIA Regulations, 2014 outline specific requirements that a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures must be provided in the BAR.

The assessments undertaken are based on conservative methodologies and these methods attempts to determine potential negative impacts that could occur on the affected environmental aspects. These impacts may however be of smaller magnitude than predicted, while benefits could be of a larger extent than predicted.

This section outlines various limitations to the specialist studies that have been undertaken and indicates, where appropriate, the adequacy of predictive methods used for the assessment. This has been done to provide the authorities and interested and affected parties with an understanding of how much confidence can be placed in this impact assessment.

The impact assessment has investigated the potential impact on key environmental media relating to the specific environmental setting for the site. A number of desktop assessment were undertaken and result thereof and are presented in this report under baseline information in section five above.

The information provided in this BAR and EMPr is therefore considered sufficient for decision-making purposes.

6.8. REASONED OPINION AS TO WHETHER THE PROPOSED PROJECT SHOULD OR SHOULD NOT CONTINUE

6.8.1. Reason why the activity should be authorised or not

According to the impact assessment undertaken for the proposed area, the key impacts of the area are on soils, natural vegetation and land owners/occupiers.

The area will also have positive impacts due to the employment to be created although it will be for a short-term period.

The public will also be requested for their comments. All comments to be received during Public Participation Process will be included in the final BAR and EMPr. These comments will be addressed the as far as possible to the satisfaction of the interested and affected parties.

The management of the impacts identified in the impact assessment for all phases of the proposed area will be undertaken through a range of programmes and plans contained in the EMPr. In consideration of the programmes and plans contained within the EMPr, layouts and method statements compiled for the area, which is assumed will be effectively implemented, there will be significant reduction in the significance of potential impacts.

Based on the above, it is; therefore, the opinion of the EAP that the activity should be authorised.

6.8.2. Conditions that must be included in the authorisation

In authorising the proposed Vleifontein prospecting project; the following conditions should form part of the environmental authorisation:

- Copper Corp (Pty) Limited may not alter the location of any of the project activities included in this environmental impact assessment without obtaining the required environmental authorisation to do so under NEMA.

- Copper Corp (Pty) Limited will not undertake any new activity that was not part of this environmental impact assessment and that will trigger a need for an environmental authorisation without proper authorisation.
- The EMPr must be implemented fully at all stages of the proposed project.
- Copper Corp (Pty) Limited must limit night-time operations. This would be relevant for all work taking place at night within 150 m from the closest receptors in this community. If night work is conducted, such must be conducted in agreement with the land owners and affected parties (lawful land occupier and labours).

6.9. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION

Based on the prospecting method statement, the environmental authorisation should be given for five (5) years.

6.10. UNDERTAKING

The signed undertaking will be presented to the DMRE on execution of the Vleifontein prospecting project.

6.11. FINANCIAL PROVISION

According to Appendix 3 of the EIA Regulations, 2014, where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts must be provided in the BAR and EMPr. In order to avoid duplication, the financial provision for the proposed area has only been provided under the relevant section of the EMPr.

6.12. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

Aside from the BAR and EMPr no other information has been requested by the competent authority.

6.13. OTHER MATTERS REQUIRED IN TERMS OF SECTION 24 (4) (A) AND (B) OF THE ACT

Any matter required in terms of the above section of the Act will be complied together by Copper Corp (Pty) Limited.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME

1. DETAILS OF THE EAP

EAP: Mr. Ornassis Tshepo Shakwane

Professional registration:

SACNASP: 117080

EAPASA: 2019/1763

IAIA Membership No.: 3847

Company: Geovicon Environmental (Pty) Limited

Postal Address:

P.O. Box 4050

MIDDELBURG, 1050

Tel: (013) 243 5842

Fax: (086) 632 4936

Cell No.: 082 498 1847

Email: tshepo@geovicon.co.za

1.1. EXPERTISE OF THE EAP WHO PREPARED THE BAR AND EMPR

Geovicon Environmental (Pty) Limited is a geological and environmental consulting company. The company was formed during 1996, and currently has more than 20 years' experience in the geological and environmental consulting field. Geovicon Environmental (Pty) Limited has successfully completed consulting areas in the Mining sector (coal, gold, base metal and diamond), Quarrying sector (sand, aggregate and dimension stone), Industrial sector and housing sector. Geovicon Environmental (Pty) Limited has undertaken contracts within all the provinces of South Africa, Swaziland, Botswana and Zambia. During 2001 Geovicon Environmental (Pty) Limited entered the field of mine environmental management and water monitoring.

Geovicon Environmental (Pty) Limited is a Black Economically Empowered Company with the BEE component owning 60% of the company. Geovicon Environmental (Pty) Limited has three directors i.e., O.T Shakwane, J.M. Bate and T.G Tefu.

Mr. O.T Shakwane obtained his BSc (Microbiology and Biochemistry) from the University of Durban Westville in 1994, and completed his honours degree in Microbiology in 1995. Mr O.T Shakwane has also completed short courses on environmental law and environmental impact assessment with the University of Mpumalanga's Centre for Environmental Management. He has worked with the three state departments tasked with mining and environmental management i.e., Department of Water and Sanitation (Gauteng and Mpumalanga Region), Department of Mineral Resources and Energy (Mpumalanga Region) and Department of Agriculture, Conservation and Environment (Gauteng Region). Mr. Shakwane has been in the consulting field since 2004 and has completed various areas similar to the proposed Vleifontein prospecting project as an environmental assessment practitioner. Mr Shakwane is the environmental assessment practitioner for the environmental impact assessment for the proposed Vleifontein prospecting project.

Over the past years Geovicon Environmental (Pty) Limited has formalised working relationships with companies that offer expertise in the following fields i.e., Geohydrology, Civil and Geotechnical

Engineering, Geotechnical Consultancy, Survey and Mine Planning and Soil & Land Use Consultancy. Geovicon Environmental (Pty) Limited is an independent consulting company, which has no interest in the outcome of the decision regarding the Vleifontein prospecting project basic assessment process.

The curriculum vitae of the EAP is attached as **Appendix B.**

2. DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

2.1. DATA GATHERING

Relevant information regarding the potential of the identified prospecting project area will be sourced from institutions like the Council for Geoscience. This information will be analysed and interpreted through computer modelling of existing data.

The interpretation of the said data will result in compiling literature review report. The said report will give indication as to what processes (in order of priority) to follow to complete the prospecting activities.

2.2. FIELD MAPPING

The field mapping will include field surveying (to determine sensitive areas), geophysical surveys and pegging of the drilling sites.

2.3. DETAILED SITE SURVEY AND INVESTIGATION

Demarcation of sensitive and protected areas will be conducted by a physical survey of the proposed area by a suitability qualified person. This should be done before establishment of access to the site, caravan structure and drilling of exploration boreholes.

2.4. GEOPHYSICAL SURVEYS AND DATA INTERPRETATION

Geophysical surveys will be used over the proposed prospecting site.

2.5. PEGGING OF DRILL SITES

All exploration borehole sites will be staked by a suitably qualified person. The sites will thereafter be plotted on a plan drawn to an appropriate scale.

2.6. ESTABLISHMENT OF ACCESS

There is a good network of both tarred and gravel roads connecting the prospecting area with surrounding towns. Existing roads to be used for the proposed area include the R49 Provincial Road that passes through the proposed Vleifontein prospecting area, and number of private farm roads. Where necessity, arise for access to the drilling sites, tracks will be established as access to the drilling site. These, tracks will be established to be more than a hundred meters away from any sensitive landscapes. The tracks will also be sited away from protected areas. Vegetation clearance will be avoided during the establishment of the access roads.

2.7. ESTABLISHMENT OF CARAVAN SITE

Caravans, ablution facilities (chemical toilets) and waste storage facilities will be provided for employees. Clearing of vegetation will be avoided during the establishment of the caravan site.

2.8. DIAMOND DRILLING FOR BOREHOLES AND SUMP CONSTRUCTION

Geological boreholes will be drilled on a predetermined grid. During drilling of each borehole, a sump of approximately 1.0 x 1.0 x 1.0 m will be excavated for collecting of water from the drilling operation and for reusing the water used for the cooling of the drilling machine.

2.9. TOPSOIL STORAGE SITE

The top and sub soils removed from the sump and drilling boreholes will be stockpiled in close proximity to the sumps. The sumps will be backfilled manually by spades, once drilling and sampling of boreholes is completed.

2.10. LOGGING AND SAMPLING OF THE CORE

This involves the physical description of the rocks intersected by the drilling process. The interpretation of these rock descriptions will assist in establishing the general stratigraphy of the area. Sampling will be taken at the desired horizons and sent to the laboratory for analyses.

2.11. SITE REHABILITATION

Concurrent rehabilitation (Plugging and reseeding) of disturbed areas will be undertaken as drilling continues.

2.12. FINAL REHABILITATION

Except for farm roads, no tracks and infrastructure related to the prospecting operation will remain in place after the decommissioning phase. Where tracks have resulted in more damage, such tracks will be ripped and allowed to return to the natural state, and seeding is not done as experience has shown that the natural process returns the site to its former state within a seasonal cycle. The sumps will be rehabilitated in such a manner to return the area to as close as possible to its pre-drilling environment.

Post closure, the prospecting right area will consist of re-vegetated areas with vegetation cover comparable to the surrounding areas. This will be unaffected by the prospecting activities. No prospecting related infrastructure will remain on the prospecting site. The area will conform to the pre-prospecting topography. The areas affected by prospecting will be stable and erosion free.

2.13. AFTER CLOSURE PHASE

The rehabilitated area will be monitored on a quarterly basis to ensure that the site returns to an acceptable state, in the event that is not happening naturally, the area will be seeded. After the decommissioning of the site and if it can be determined that the site is stable, an Environmental Authorisation for the decommissioning of the site and a closure certificate will be applied for in terms of the relevant laws.

Please note that the final borehole layout can only be determined once the prospecting right is granted, thereafter it will be sent to the Department of Mineral Resources and Energy (DMRE).

3. COMPOSITE MAP

The map superimposing the proposed project, its associated structures and infrastructure on the environmental sensitivities of the preferred site will be provided on approval of the EMPr.

4. DESCRIPTION OF THE MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

4.1. GENERAL CLOSURE PRINCIPLES AND OBJECTIVES

The following are the closure objectives, general principles and objectives guiding closure of the Vleifontein prospecting area closure planning:

- Rehabilitation of areas disturbed as a consequence of prospecting to a land capability that will support and sustain a predetermined post-closure land use;
- Removal of all infrastructure/equipment that cannot be beneficially re-used, as per agreements established, and returning the associated disturbed land to the planned final land use;
- Removal of existing contaminated material from affected areas;
- Establishment of final landforms that are stable and safe in the long run;
- Establishment and implementation of measures that meet specific closure related performance objectives;
- Monitoring and maintenance of rehabilitated areas forming part of site closure to ensure the long-term effectiveness and sustainability of measures implemented.

4.2. MANAGEMENT OF ENVIRONMENTAL DAMAGE, ENVIRONMENTAL POLLUTION AND ECOLOGICAL DEGRADATION CAUSED BY THE VLEIFONTEIN PROSPECTING AREA ACTIVITIES

The following actions will be undertaken by Copper Corp (Pty) Limited to ensure that the closure objectives are attained.

4.2.1. Infrastructure Areas

- All infrastructure and equipment used during the prospecting operation will be removed from the site.
- All haul roads that were used for access during prospecting will be allowed to re-establish to its pre-prospecting condition. Should unsatisfactory results be noted, the area will be physically rehabilitated.
- All rehabilitated areas will be maintained for a period of 2 years, where after the frequency will be reassessed. Where necessary, vegetation cover will be maintained by annual application of fertiliser.
- Maintenance with respect to erosion will be conducted on a minimum three-monthly basis if and where required.

4.2.1.1. Buildings (Offices, Workshops and Stores)

Mobile structures will be used and such structures will be removed from the sites during decommissioning of the site.

4.3. POTENTIAL RISK OF ACID MINE DRAINAGE

No potential risk of acid mine drainage.

4.4. STEPS TAKEN TO INVESTIGATE, ASSESS AND EVALUATE THE IMPACTS OF THE ACID MINE DRAINAGE

Since there is no risk of acid mine drainage, there will be no need for steps to be taken to investigate, assess and evaluate the impacts of acid mine drainage.

4.5. ENGINEERING AND DESIGNS SOLUTIONS TO BE IMPLEMENTED TO AVOID OR REMEDY ACID MINE DRAINAGE

Since there is no risk of acid mine drainage, there will be no need for measures to remedy residual or cumulative impacts from acid mine drainage.

4.6. MEASURES TO REMEDY RESIDUAL OR CUMULATIVE IMPACTS FROM ACID MINE DRAINAGE

Since there is no risk of acid mine drainage, there will be no need for measures to remedy residual or cumulative impacts from acid mine drainage.

4.7. VOLUMES AND RATES OF WATER USE REQUIRED FOR THE PROPOSED PROJECT

Since there is no risk of acid mine drainage, this section will not applicable.

4.8 WATER USE LICENCE APPLICATION

No water use activities will be undertaken during the proposed prospecting operation; hence no water use licence will be applied for.

5. ENVIRONMENTAL MANAGEMENT PROGRAMME

Table 15: Environmental Management Programme for the proposed Vleifontein prospecting project.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency For Monitoring	Time period for Management Action
CONSTRUCTION PHASE								
Establishment of access, to prospecting sites, establishment of the campsite, physical surveying of the site and pegging of drilling boreholes								
Loss of soils, erosion of the soils and impacts on land owner's livelihood.	Soils, Land Use and Land Capability.	To ensure that the activities in the development of the prospecting sites and associated infrastructure do not have detrimental impacts on the soils, land use and land capability.	Ensure that the establishment of the prospecting sites is undertaken in accordance with the approved EMPR.	Establishment of the site will be undertaken according to the prospecting method statement.	Appointed contractor and site manager.	Visual monitoring through inspections.	Environmental Control Officer (ECO) during construction.	During construction phase.
			Buffer zones will be instituted around farm dwellers immediately and adjacent to the prospecting areas. No prospecting activities will be undertaken within the instituted buffer zones.	No soil stripping will be allowed during site establishment. Should it be necessary to conduct geophysical surveys and geological mapping, ensure minimal disturbance of soil.	Appointed contractor. Appointed contractor.	Visual monitoring and inspections	ECO monthly.	During construction phase.
				Any area that may result into the disturbance of the soils must be rehabilitated immediately on discovery.	Appointed contractor and the applicant site manager.	Visual monitoring and inspections.	ECO monthly.	During construction phase.
				Machinery to be used for the operation will be of good working conditions. Any hydrocarbon spill from the site establishment will be remediated as soon as possible.	Appointed contractor.	Visual monitoring and inspections.	ECO monthly.	During construction phase.
				Use sites that are unused and that are in the degraded state for the proposed development. This must be done in agreement with the land owner. The sitting of the boreholes must be conducted such that ensure that rocky ridges, sensitive grass lands, indigenous trees and shrubs, sites of geological importance and farmlands actively used for crop farming are avoided.	Appointed contractor.	Visual monitoring and inspections	ECO monthly.	During construction phase.
				No-go zones will be instituted around farm dwellers, existing infrastructure and any operation immediately and adjacent to the prospecting areas. No prospecting activities will be undertaken within the instituted no-go zones.	Appointed contractor	Undertake regular inspections.	ECO monthly.	During construction phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency For Monitoring	Time period for Management Action
Loss of natural vegetation in the affected areas.	Natural vegetation	To ensure that the establishment of the prospecting site and associated infrastructure/equipment do not have detrimental impact on the area's flora.	The management of the impact will comply with the company's biodiversity management plan. Ensure that protected species should they be identified are not destroyed.	Use sites with most disturbed vegetation cover for the development. Before the drilling activities can commence, a biodiversity specialist must do a site inspection on the proposed marked drilling sites (proposed boreholes) to assess if there are no protected and/or critical natural vegetation. If any protected and/or critical natural vegetation occurs, the location of the proposed boreholes must be changed.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	During construction phase.
				Pictures of possible plant species of conservation concern that may be present in the prospecting right area will be made available to the drilling crew for easy identification and avoidance.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	During construction phase.
				No strip of topsoil and vegetation will be allowed during site establishment.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	During construction phase.
				Ensure minimal disturbance of vegetation when conducting geophysical surveys and geological mapping.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly	During construction phase.
				Any area that may result into the disturbance of the vegetation cover must be rehabilitated immediately on discovery.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly	During construction phase
				The making of fire will be strictly prohibited. Firefighting equipment will always be kept at the prospecting site ready, in a good working condition and at an accessible location. Correct fire extinguishers will be used to extinguish the fire. Note that no water on electrical and liquid based fires will be used. The employees will be trained on dealing with fire situation. First aid equipment will be made available at all times. If the fire seems to go out of control, the Fire Brigade from the nearby town will be contacted. Vleifontein prospecting right project will establish a working agreement with the Fire Brigade from	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly	During construction phase

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency For Monitoring	Time period for Management Action
				the nearby town to make themselves available at any time in a case fire are out of control. No person shall place, throw or leave, or cause or permit to be placed, thrown or left, any naked light or flame or any burning lighting torch, match, cigarette, tobacco, paper or other burning material on or near any combustible material or inflammable substance where this may cause danger from fire or explosion; No waste material of a combustible nature shall be stored anywhere in quantity sufficient to create a fire hazard; No welding, flame-cutting or flame-heating shall take place unless adequate means are immediately available for extinguishing any fire which may result from such operation; On completion of any welding, flame-cutting or flame-heating, an examination shall be carried out by a competent person to ensure that no fire will result from such operation; All machinery shall be so constructed, installed, operated and maintained as to prevent as far as practical, dangerous heating.				
Migration of animal life due to disturbance caused proposed area	Animal Life	Ensure that the animal life within in the area is not affected by the proposed area	Maintenance of the current status on animal life within the area	Establishment of the site will be undertaken according to the prospecting method statement. No soil stripping will be allowed during site establishment. Any area that may result into the disturbance of the soils must be rehabilitated immediately on discovery. Use sites with most degraded environment for the site development. Poaching will be prohibited at the prospecting site. Before the drilling activities can commence, a biodiversity specialist must do a site inspection on	Appointed contractor and site manager. Appointed contractor and site manager. Appointed contractor and site manager. Appointed contractor and site manager.	Visual monitoring and inspections. Visual monitoring and inspections. Visual monitoring and inspections. Visual monitoring and inspections.	ECO monthly. ECO monthly. ECO monthly. ECO monthly.	During construction phase. During construction phase. During construction phase. During construction phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency For Monitoring	Time period for Management Action
				the proposed marked drilling sites (proposed boreholes) to assess if there are no animal burrows and habitats. If any burrows or habitat exist, the location of the proposed boreholes must be changed				
Deterioration of water quality in in the nearby steams and within the groundwater regime.	Surface and Ground Water.	Ensure that the establishment of the area and its associated infrastructure does not have detrimental impact on nearby stream and the groundwater regime.	The quality of streams and groundwater within the site will comply with the target DWS target water quality objectives. Construction will be in compliance with the regulations under the GN704.	Site establishment will not be undertaken within sensitive landscapes. These areas will be avoided. A distance of 100 meters will be created between the sites and the sensitive landscapes. The applicant must also apply for a GA before drilling within 500m of nearby streams and/or wetlands	Appointed contractor and site manager.	Regular inspections	ECO monthly.	During construction phase.
				Avoid stripping of areas within the construction sites.	Appointed contractor and site manager.	Regular inspections	ECO monthly.	During construction phase
				Rehabilitate areas that may have been mistakenly stripped.	Appointed contractor and site manager.	Regular inspections	ECO monthly.	During construction phase
				Storm water upslope of the campsite and drill sites should be diverted around these areas.	Appointed contractor and site manager.	Regular inspections	ECO monthly.	During construction phase
				Proper waste management facilities will be put in place at the campsite and drilling site. Any hydrocarbon spill from the site establishment will be remediated as soon as possible.	Appointed contractor and site manager.	Regular inspections	ECO monthly.	During construction phase.
Wetland destruction and loss of habitat.	Sensitive Landscapes.	Ensure that the construction activities do not have detrimental impacts on the sensitive landscapes.	Maintain the current state of the sensitive landscapes within the area (farm dams and seepage zone).	Construction activities will be limited to be more than hundred meters from the edge of the dams and seepage zone. The applicant must also apply for a GA before drilling within 500m of nearby streams and/or wetlands Should prospecting activities be planned within sensitive areas, relevant environmental investigations will be conducted in order to define already disturbed areas, for drilling activities.	Appointed contractor and site manager.	Inspection to ensure compliance with the action plan will be conducted at the construction site.	ECO will conduct the inspections monthly.	Whenever construction is undertaken near the sensitive landscapes.
Air pollution through air pollutants' emissions, from the construction site.	Air quality.	Ensure that all operations during the construction phase do not result in detrimental air quality impacts.	The construction will be undertaken such that the ambient air quality does not exceed the National Air Quality Standards.	Wet suppression using will be conducted at areas with excessive dust emissions.	Appointed contractor and site manager.	Visual inspections of areas with possible dust emissions.	ECO monthly.	Throughout the construction phase.
				Traffic will be restricted to demarcated areas and traffic volumes and speeds	Appointed contractor and site manager.	Regular inspections.	ECO monthly.	Throughout the construction phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency For Monitoring	Time period for Management Action
				within the construction site will be controlled.				
Increased noise levels.	Noise aspects.	Ensure that the noise levels emanating from the construction sites will not have detrimental effects on the mine employees and surrounding communities/land owners.	The noise levels from the construction sites will be managed and measures will be taken to ensure that noise levels are below the National Noise Control Regulations, SANS10103:2008 guidelines.	Limit the maximum speed to 60 km/h or less, subject to risk assessment. Less noisy equipment will be used, the equipment will be kept in good working order and the equipment will be fitted with correct and appropriate noise abatement measures. This will reduce the impact of noise to the surrounding community Ensure that the employees are issued with earplugs and that they are instructed to use them. Educate employees on the dangers of hearing loss due to mine machinery noise.	Appointed contractor and site manager. Site manager. Site manager.	Undertake site checks on speeds used. Speed checking will be conducted. Use of earplugs will be checked and reported.	Site manager. Site manager checking as regularly as possible. Site manager will check the use of the earplugs as regularly as possible.	Throughout the construction phase. Throughout the duration of the construction phase Throughout the duration of the construction phase.
Visual impacts on the surrounding communities and road users from the construction.	Visual aspects.	Ensure that all operations during the construction phase do not result in detrimental visual impacts on surrounding properties, communities and road users.	Measures will be undertaken by the mine to ensure that the visual aspects from the site are complying with the relevant visual standards and objectives.	The land owner will be informed on the type of machinery and equipment to be used at the prospecting sites. Lighting will be conducted in manner that will reduce the impacts on visual aspects at night times.	Applicant and site manager. Appointed contractor.	The constructed perimeter berms will be inspected for compliance with the design specifications. Night time inspection of the site will be undertaken.	Mine Engineer on a monthly basis. The site manager once	Throughout the construction phase. During construction phase.
Damage or destruction of sites with archaeological and cultural significance.	Sites of archaeological and cultural importance.	Ensure that the construction activities do not have detrimental impacts on the heritage sites.	The construction will be undertaken in compliance with the requirements of the National Heritage Resources Act, 1999 (Act 25 of 1999) and recommendations from the specialist.	The establishment of the sites will be away from any identified grave site or heritage sites. A buffer of hundred meters will be created between the sites and the proposed camp and drilling sites.	Appointed contractor and site manager.	The site will be monitored for any damages on a regular basis.	ECO monthly	Throughout the construction phase when activities are in close proximity to the heritage sites.
Impact from the influx of job seekers and employment of farm labourers.	Socio-economic aspects.	Ensure that measures are taken to discourage influx of job seekers and employment of farm labourers.	Measures taken will be in line with the company's recruitment policies.	Recruitment will not be undertaken on site.	Appointed contractor and site manager.	Visual monitoring.	Site manager	Throughout the pre-construction and construction phase.
OPERATIONAL PHASE								
Diamond Core drilling of the exploration boreholes, use of campsite and rehabilitation of the drilling sites								

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency For Monitoring	Time period for Management Action
Soil profile disruption, contamination of soils, destruction of natural vegetation and loss of land use.	Soils, Natural Vegetation, Land Use and Land Capability.	Ensure that the operation of the drilling sites and use of campsite and rehabilitation of drilling site do not have detrimental impacts on the soils, natural vegetation and current land use.	The land use and capability of the sites where the operations will be undertaken will continue after the proposed area.	Ensure that the drilling of the exploration boreholes is done in such a manner that the environment is protected from probable spillages and contamination by carbonaceous material. Before the drilling activities can commence in areas where vegetation will be affected, a biodiversity specialist must do a site inspection on the proposed marked drilling sites (proposed boreholes) to assess if there are no protected and/or critical natural vegetation. If any protected and/or critical natural vegetation occurs, the location of the proposed boreholes must be changed. Pictures of possible plant species of conservation concern that may be present in the prospecting right area will be made available to the drilling crew for easy identification and avoidance.	Appointed contractor and site manager.	Regular inspections	ECO monthly.	During the operational phase of the area.
				All boreholes and sumps will be rehabilitated to pre-drilling conditions.	Appointed contractor.	Regular inspections	ECO monthly.	During the operational phase of the area.
				Tarpaulins will be placed on the ground to prevent oil, grease, hydraulic fluid and diesel spills during emergency repairs. All oil spills will be remedied using approved methodologies. The contaminated soils will be removed and disposed of at a licensed waste disposal facility.	Appointed contractor.	Regular inspections.	ECO monthly.	During the operational phase of the area.
				All waste generated from the drilling sires and the campsite will be collected in proper receptacles and removed top registered disposal facilities e.g., sewage treatment plant, sold waste disposal site or hydrocarbon recycling or treatment facilities.	Appointed contractor.	Inspection of the site will be conducted.	ECO monthly.	During the operational phase of the area.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency For Monitoring	Time period for Management Action
				The making of fire will be strictly prohibited. Firefighting equipment will always be kept at the prospecting site ready, in a good working condition and at an accessible location. Correct fire extinguishers will be used to extinguish the fire. Note that no water on electrical and liquid based fires will be used. The employees will be trained on dealing with fire situation. First aid equipment will be made available at all times. If the fire seems to go out of control, the Fire Brigade from the nearby town will be contacted. Vleifontein prospecting right project will establish a working agreement with the Fire Brigade from the nearby town to make themselves available at any time in a case fire are out of control. No person shall place, throw or leave, or cause or permit to be placed, thrown or left, any naked light or flame or any burning lighting torch, match, cigarette, tobacco, paper or other burning material on or near any combustible material or inflammable substance where this may cause danger from fire or explosion; No waste material of a combustible nature shall be stored anywhere in quantity sufficient to create a fire hazard; No welding, flame-cutting or flame-heating shall take place unless adequate means are immediately available for extinguishing any fire which may result from such operation; On completion of any welding, flame-cutting or flame-heating, an examination shall be carried out by a competent person to ensure that no fire will result from such operation; All machinery shall be so constructed, installed, operated and maintained as to prevent as far as practical, dangerous heating.	Appointed contractor.	Inspection of the site will be conducted.	ECO monthly.	During the operational phase of the area.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency For Monitoring	Time period for Management Action
				Use sites that are unused and that are in the degraded state for the proposed development. This must be done in agreement with the land owner. The sitting of the boreholes must be conducted such that rocky ridges, sensitive grass lands, indigenous trees and shrubs and sites of geological importance are avoided. No-go zones will be instituted around farm dwellers, existing infrastructure and any operation immediately and adjacent to the prospecting areas. No prospecting activities will be undertaken within the instituted no-go zones.	Appointed contractor.	Inspection of the site will be conducted.	ECO monthly.	During the operational phase of the area.
Migration of animal life due to disturbance caused proposed area	Animal Life	Ensure that the animal life within in the area is not affected by the proposed area	Maintenance of the current status on animal life within the area	Sites will be operated according to the prospecting method statement. As much as possible sites with degraded environment will be used or the drilling purposes. Poaching will be prohibited at the prospecting site. Before the drilling activities can commence, a biodiversity specialist must do a site inspection on the proposed marked drilling sites (proposed boreholes) to assess if there are no animal burrows and habitats. If any burrows or habitat exist, the location of the proposed boreholes must be changed	Appointed contractor and site manager. Appointed contractor and site manager. Appointed contractor and site manager.	Visual monitoring and inspections. Visual monitoring and inspections. Visual monitoring and inspections.	ECO monthly. ECO monthly. ECO monthly.	During operational phase. During operational phase. During operational phase.
The drilling operation and use of campsite may result in the generation of surface water runoff contaminated with silt (sedimentation) and possibly hydrocarbon fluids should spillages occur.	Surface and Ground Water.	Ensure that the drilling operation does not have detrimental impacts on the surface and ground water environment.	Clean surface and ground water environment/regime will not be affected.	No prospecting operations will be undertaken within 100 metres from the nearby steams and 100 meters from the nearby wetland areas. The applicant must also apply for a GA before drilling within 500m of nearby streams and/or wetlands The sumps will be excavated for the collection mud and excess water from the drilling sites. The sump will be sized such that it will be able to contain the water and mud that will be generated during the prospecting operation.	Appointed contractor and site manager. Appointed contractor and site manager.	Visual monitoring and inspections. Visual monitoring and inspections.	ECO monthly. ECO monthly.	During operational phase. During operational phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency For Monitoring	Time period for Management Action
				Storm water generated around the drilling site will be diverted away to the clean water environment. No concrete mixing and vehicle maintenance will be allowed on site. All hydrocarbons will be stored on protected storage areas away from the streams.	Appointed contractor and site manager.	Visual monitoring and inspections.	ECO monthly.	During operational phase.
		Ensure that drilling operation does not have a detrimental impact on the number of aquifers underlain by the site.	Aquifers will not be affected.	Ensure that the land owners' borehole yield is observed during the drilling operation. Should it be proven that the operation is indeed affecting the quantity and quality of groundwater available to users and surrounding water resources, the affected parties must be compensated.	Appointed contractor and site manager.	Regular meetings with landowners.	Site manager.	During operational phase.
				Ensure minimum distance as per legislation is kept from the waste disposal site. Ensure that an experienced geologist must oversee the drilling process.	Appointed contractor and site manager	Visual monitoring and inspections.	ECO monthly.	During operational phase.
Generation of dust and fuel fumes by vehicular movement.	Air quality.	Ensure that the air quality in the vicinity of the prospecting sites and sites' access routes are not detrimentally altered.	The air quality in the vicinity of the drilling sites and sites' access routes will be maintained to stay within the national air quality standards.	Dust suppression must be conducted during the operational phase of the area.	Appointed contractor and site manager.	Visual inspections of areas with possible dust emissions.	ECO monthly.	Throughout the operational phase.
				Correct speed will be maintained at the proposed area site.	Appointed contractor and site manager.	Regular speed checks.	Site manager monthly.	Throughout the operational phase.
				Vehicle maintenance must be conducted regularly to avoid excessive diesel fumes.	Appointed contractor and site manager.	Regular inspections.	ECO monthly.	During operational phase.
Wetland destruction and loss of habitat.	Sensitive Landscapes.	Ensure that the drilling operation does not have detrimental impacts on the farms dams and identified seepage zone.	Maintain the current state of the wetlands within the area.	Operation of the drilling site will be limited to be more than hundred meters from the edge of the sensitive landscapes. The applicant must also apply for a GA before drilling within 500m of nearby streams and/or wetlands	Appointed contractor.	Inspection to ensure compliance with the action plan.	ECO monthly.	During operational phase.
				Drilling activities will, as far as possible, not be undertaken within the sensitive areas. Should prospecting activities be planned within sensitive areas, relevant environmental investigations will be	Appointed contractor.	Inspection to ensure compliance with the action plan	ECO monthly.	During operational phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency For Monitoring	Time period for Management Action
				conducted in order to define already disturbed areas, for drilling activities.				
Increased noise levels.	Noise aspects.	Ensure that the noise levels emanating from the operational sites will not have detrimental effects on the mine employees and surrounding communities/land owners.	The noise levels from the sites will be managed and measures will be taken to ensure that noise levels are below the National Noise Control Regulations, SANS10103:2008 guidelines.	Limit the maximum speed to 60 km/h or less, subject to risk assessment. Less noisy equipment will be used, the equipment will be kept in good working order and the equipment will be fitted with correct and appropriate noise abatement measures. This will ensure that the surrounding community is not affected by noise. Ensure that the employees are issued with earplugs and that they are instructed to use them. Educate employees on the dangers of hearing loss due to mine machinery noise.	Appointed contractor and site manager. Site manager. Appointed contractor.	Site checks regularly. Regular monitoring and site check. Use of earplugs will be checked and reported.	Site manager. Site manager. Site manager.	During operational phase. During operational phase. During operational phase.
Visual impacts on the surrounding communities and road users from the construction.	Visual aspects.	Ensure that the drilling operations do not result in detrimental visual impacts on surrounding properties, communities and road users.	Measures will be undertaken by the mine to ensure that the visual aspects from the site are complying with the relevant visual standards and objectives.	The land owner will be informed on the type of machinery and equipment to be used at the prospecting sites. Lighting will be conducted in manner that will reduce the impacts on visual aspects at night times.	Applicant and site manager. Appointed contractor.	The constructed perimeter berms will be inspected for compliance with the design specifications. Night time inspection of the site will be undertaken.	Mine Engineer on a monthly basis. The site manager once	During operational phase. During operational phase.
Damage or destruction of sites with archaeological and cultural significance.	Sites of archaeological and cultural importance.	Ensure that the operational activities does not have detrimental impacts on the heritage sites.	The drilling operations will be undertaken in compliance with the requirements of the National Heritage Resources Act, 1999 (Act 25 of 1999) and recommendations from the specialist.	The drilling sites will be away from any identified grave site or heritage sites. A hundred-meter buffer will be created between the sites and the proposed camp and drilling sites.	Appointed contractor.	The site will be monitored for any prospecting related damages on a regular basis.	ECO monthly.	Throughout the operational phase.
Safety, intrusion and livelihood impacts on the landowners and occupiers.	Socio-economic aspects.	Ensure that the drilling operation does not significantly disrupt the daily living and movements of the land owners and occupiers.	The mine will ensure that all safety standards are met and that access to landowners and occupiers	Announce any road closures and other disruptions and maintain roads used for the operation in good order.	Appointed contractor and site manager.	Liaison with affected parties.	Site manager as and when necessary.	Throughout the operational phase.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency For Monitoring	Time period for Management Action
			are not detrimentally affected.	Keep communication with land owners and land occupiers open during the operational phase of the area. Ensure that negotiations on compensation are undertaken before the drilling programme can commence. This will include any other conditions that the landowner may deem necessary for the prospecting operation. Ensure that safety measures are implemented to prevent impacts on land owners and occupiers.	Applicant and site manager. Site manager.	Meetings with the landowners. Minutes of any meeting held with landowners and agreements will be recorded and filed. Regular checks and inspections.	Site manager as and when meetings are held. Site manager.	Throughout the operational phase. Throughout the operational phase.
DECOMMISSIONING AND CLOSURE PHASE								
Removal of infrastructure and final rehabilitation of disturbed areas								
Compaction and contamination of soils within the rehabilitation site.	Soils.	Ensure that the soils in the vicinity of the rehabilitation site is not detrimentally impacted.	Rehabilitated areas will be maintained to comply with the closure objectives.	All vehicles and machinery used at the rehabilitation site will be kept in good working order. No repairs of vehicles or machinery will be conducted at the rehabilitation site unless it is emergency repairs, which will be conducted on protected ground. Movement of mine vehicles and machinery will be limited to demarcated routes, which will be rehabilitated when no longer in use.	Appointed contractor. Appointed contractor. Appointed contractor.	Vehicles and machinery will be inspected regularly and any oil incidences will be reported. All incidents of emergency repairs will be inspected and occurrence recorded. Rehabilitation site will be inspected to monitor areas with compaction or hydrocarbon contamination.	Site manager will conduct the inspections monthly. Site manager. ECO will conduct the inspections monthly.	Throughout the decommissioning and closure phases. Throughout the decommissioning and closure phases. Throughout the decommissioning and closure phases.
Re-instatement of soil productivity, land capability, land use and topographical patterns.	Soils, Land Capability, Land Use and Topography.	Ensure that the rehabilitation of the sites re-instate the soil productivity, land capability, land use and topographical patterns	Rehabilitated areas will be maintained to comply with the closure objectives.	All infrastructure will be removed from the site in accordance to the rehabilitation plan. Ensure that there is no infestation of alien invasive plant species.	Appointed contractor.	Removal of the infrastructure will be inspected.	Site manager will conduct the inspections.	During decommissioning phase.
Pollution of surface water environment.	Surface Water.	Ensure that the rehabilitation of the site does not have detrimental impacts on the surface water environment.	The surface water leaving the rehabilitation site will comply with the DWS target water quality parameters.	The site area will be rehabilitated to be free draining. Erosion protection measures such as the use of contour berms and repair of gullies will be undertaken until such time	Appointed contractor. Appointed contractor.	Progress of rehabilitation will be monitored. Areas where grass has not yet been established will be	ECO will conduct monitoring of the rehabilitation annually.	Throughout the decommissioning and closure phases.

Impact Activity Reference	Environmental Attribute	Impact Management Objectives	Targets (Impact Management Outcomes)	Management Actions and Interventions	Responsibility For Actions/Intervention	Monitoring Action	Responsibility and Frequency For Monitoring	Time period for Management Action
				that the rehabilitated surfaces can be shown to be sustainable. Existing roads should be used where possible and new disturbed areas should be minimised.	Rehabilitation officer.	monitored for excessive erosion. Rehabilitation site will be inspected for misuse.		
Air pollution from rehabilitation site.	Air quality.	Ensure that rehabilitation do not have detrimental impacts on air quality.	Decommissioning and rehabilitation of the site will be conducted in such a manner that the ambient air quality does not exceed the air quality standards.	Where necessary, wet suppression will be conducted at areas with excessive dust emissions. Vehicles and machinery will be well maintained. The traffic volumes and speed within the rehabilitation site will be controlled.	Appointed contractor. Site manager and appointed contractor.	Visual inspections of areas with possible dust emissions will be conducted Site inspections will be conducted.	ECO will conduct inspections monthly. Site manager will conduct inspections monthly.	Throughout the decommissioning phase. Throughout the decommissioning phase.
Generated noise from the rehabilitation site.	Noise.	Ensure that the rehabilitation activities do not have detrimental impacts on people.	Ensure that the noise from the rehabilitation activities do not exceed the SANS 10103 Rating Level.	Smaller or less noisy equipment should where possible be used when working near receptors. Equipment will be well maintained and fitted with the correct and appropriate noise abatement measures.	Appointed contractor and site manager. Site manager and appointed contractor.	Regular site check. Regular site check.	Site manager. Site manager.	Throughout the decommissioning phase. Throughout the decommissioning phase.
Damage or destruction of sites with archaeological and cultural significance.	Sites of archaeological and cultural importance.	Ensure that the rehabilitation does not have detrimental impacts on heritage sites.	Should heritage sites be identified, rehabilitation in close proximity to the sites will not be damaged or destroyed by the rehabilitation activities.	A hundred-meter buffer will be maintained between any site and the rehabilitation site.	Appointed contractor and the site manager.	The sites will be monitored for any rehabilitation related damages.	ECO will monitor the site monthly.	Throughout the decommissioning phase.

6. FINANCIAL PROVISION

Section 24 P of NEMA requires an applicant applying for an environmental authorisation related to mining to comply with the prescribed financial provision for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts before the Minister responsible for mineral resources issues the environmental authorisation. The above-mentioned financial provision may be in the form of an insurance, bank guarantee, trust fund or cash.

Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (GNR 1147) were promulgated on the 20th of November 2015. Copper Corp (Pty) Limited has undertaken the financial provision determination in line with the requirements of section 11 of the Regulations pertaining to the Financial Provision for prospecting, Exploration, Mining or Production Operations (GNR 1147). The financial provision determination for the proposed area is submitted to the Department of Mineral Resources and Energy (DMRE) for their consideration. Refer to Table 16 below for the calculated financial provision. .

Table 16: Financial provision

CALCULATION OF THE QUANTUM

Applicant: **Copper Corp (Pty) Ltd** **Ref No.: NW 30/5/1/1/2/13344 PR**
Evaluator: **Mr. O. T. Shakwane** **Date: 22/06/202**

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	17.33	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	241.33	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	355.65	1	1	0
3	Rehabilitation of access roads	m2	400	43.19	1	1	17276
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	419.16	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	228.63	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	482.67	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	253019.03	1	1	0
7	Sealing of shafts adits and inclines	m3	0	129.56	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0.01	168679.35	1	1	1686.7935
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	210087.08	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	610192.47	1	1	0
9	Rehabilitation of subsided areas	ha	0	14124	1	1	0
10	General surface rehabilitation	ha	0.5	133622.5	1	1	66811.25
11	River diversions	ha	0	133622.5	1	1	0
12	Fencing	m	0	152.42	1	1	0
13	Water management	ha	0	50807.03	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0.5	17782.46	1	1	8891.23
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
					Sub Total 1		94665.2735

1	Preliminary and General	11359.83282	weighting factor 2 1	11359.83282
2	Contingencies	9466.52735		9466.52735
			Subtotal 2	115491.63
			VAT (15%)	16168.83
			Grand Total	**131660**

6.1 DESCRIPTION OF CLOSURE OBJECTIVES AND EXTENT TO WHICH THEY HAVE BEEN ALIGNED TO THE DESCRIBED BASELINE ENVIRONMENT

The closure objectives for the proposed project as detailed under section 4.1 of the EMPr, were determined in consideration of physical (infrastructure), biophysical (environmental) and socio-economic measures as well as alignment to the closure components provided by the Department of Mineral Resources and Energy (DMRE). See section 4.1 for the closure objectives.

6.2 CONFIRMATION THAT THE ENVIRONMENTAL OBJECTIVES IN RELATION TO CLOSURE HAVE BEEN CONSULTED WITH LANDOWNERS AND INTERESTED AND AFFECTED PARTIES

The draft BAR and EMPr is made available to the interested and affected parties during the public participation process for the proposed project. Note that the consultation of interested and affected parties included the owners of the properties directly affected by the proposed project and owners of land immediately adjacent to the proposed project area.

The above confirms that the land owners and interested and affected parties will be consulted regarding the environmental objectives in relation to the closure of the proposed project.

6.3 REHABILITATION PLAN FOR THE PROPOSED PROJECT

In terms of NEMA EIA Regulations, 2014, a Basic Assessment Report and EMPr must indicate the impact management measures. One of the impact management measures for the proposed prospecting activity is the rehabilitation of the disturbance caused by the prospecting activities. For the purpose of this report, the rehabilitation measures for the proposed prospecting project will be provided in the form of a rehabilitation plan, described below.

The rehabilitation plan for the proposed projects describes the physical activities that will be undertaken to implement the closure plan during the course of the prospecting activities. The plan will include the following that are discussed below i.e.:

- Prospecting borehole layout
- Detail rehabilitation standards; and
- Detail the rehabilitation schedule.

6.3.1 Prospecting Borehole Layout

The prospecting layout for the proposed prospecting project will be developed to minimise negative impacts on the environment such that after land use is achieved. This layout will be developed to be in line with the closure objectives provided in this report.

The development of the prospecting layout for the proposed prospecting project will take into consideration all identified no-go areas within the prospecting right area.

In view of the above the layout plan has been developed such that the following is achieved i.e.:

- Minimise the disturbed area;
- Avoid impacts on identified sensitive areas; and
- Views of affected communities and interested and affected parties to be considered

6.3.2 Rehabilitation Standards

The following rehabilitation standards have been developed for the proposed prospecting project. These have been developed to ensure that rehabilitation will achieve the following at the project area

i.e., preserve the environment, protect against environmental damage and repair any disturbance caused during the prospecting activities.

- Rehabilitation plans will be developed before commencement of the prospecting project
- All legal requirements will be met before commencement of the prospecting project
- All disturbed areas will be rehabilitated to restore the affected environment
- Disturbed areas will be maintained for the duration of the prospecting activities such that no secondary impacts results
- All possible source of contaminants will be identified and measures taken to prevent and manage spillages
- Adequate monitoring programme must be developed and implemented
- Ensure communication with affected communities and interested and affected parties

6.3.3 Decommissioning of The Prospecting Operation

6.3.3.1 Contractor Campsite

No permanent structures will be constructed at the campsite, rather mobile structures will be used. Since these are mobile, all structures (tents or caravans, solid waste receptacles, water tanks, chemical toilet, additional storage area etc.) will be removed. Waste stored on site will be disposed of in an appropriate manner. Any industrial waste from the site will be recycled (sold) or disposed of properly. In view of the above no demolishing will be undertaken.

6.3.3.2 Roads

All constructed roads that will no longer be required by the landowner/tenant, shall be removed and/or rehabilitated to the satisfaction of the Regional Manager.

Any gate or fence erected by the holder which is not required by the landowner/tenant, shall be removed and the situation restored to the pre-prospecting situation.

6.3.3.3 Drilling site

Drilling Sump

The sumps will be backfilled and covered with topsoil.

Borehole

The borehole logs will be removed from site and the borehole plugged and covered with topsoil.

Drill Rig, Drill Rod Stand and Drill Rig stockpile.

The rods and stand will be placed in the drill rig that will be driven away from site.

Geologist sampling area

This area will have a tent/gazebo, sampling equipment and waste collection receptacles that will be placed at the LDV and taken away from the site.

6.3.3.4 Post Closure Land Use

Post closure, the prospecting area will consist of re-vegetated areas with vegetation cover comparable to the surrounding areas. No prospecting related infrastructure will remain on the prospecting site. The land use after prospecting will conform to the pre-prospecting topography. After rehabilitation, the areas affected by prospecting will be stable and erosion free.

6.3.3.5 Rehabilitation Schedule

Table 17 below provides the schedule of actions for rehabilitation, decommissioning and closure of the prospecting project, which will ensure avoidance, minimisation and management of residual or latent impacts from the proposed prospecting activities linked to the prospecting works programme including assumptions and schedule drivers.

A campsite will only be used if the applicant cannot find a suitable accommodation nearby the prospecting area.

Roads will not ideally be constructed however should the existing roads not provide the required access; tracks will be used.

Concurrent rehabilitation of disturbed areas will be undertaken as drilling continues. In view of the above, the schedule provides rehabilitation of a campsites and roads.

Table 17: Rehabilitation Schedule

Rehabilitation Actions	**Assumptions and Schedule drivers**
Rehabilitation, Decommissioning and Closure	
Activity/Area: Contractor Campsite	
Areas within the camp sites where vegetation has been removed and where the site has been compacted must be scarified and ripped.	All spills and waste material from the site would have been removed before rehabilitation. Monitoring of the rehabilitated area will be conducted to ensure that the area maintains a sustainable environment.
Before and during the prospecting operation and after rehabilitation photographs of the camp sites will be taken and kept on record.	
Activity/Area: Roads	
Any foreign material (used to construct roads) will be removed and disposed of in an approved manner prior to rehabilitation.	All spills and waste material from the site would have been removed before rehabilitation. Monitoring of the rehabilitated area will be conducted to ensure that the area maintains a sustainable environment. Except for farm roads, no tracks and infrastructure related to the prospecting operation will remain in place after the decommissioning phase. Ripping shall be at 90° to the inherent slope
Roads and tracks with significant damage will be ripped or ploughed. Where necessary, fertilizer will be applied over the area.	
Should the revegetation show to be slow, soil analyses will be conducted and the seeding be done in accordance top the results of the analyses.	

Rehabilitation Actions	**Assumptions and Schedule drivers**
Activity/Area: Drill Site	
Drill site sumps	
Sumps will either be emptied of the water or allowed water to evaporate.	Rehabilitation of the drilling site will commence immediately after completion of the drilling. The area disturbed is small – approximately 1 m x 1 m x1 m per sump per drill site. All spills and waste material from the site would have been removed before rehabilitation. Monitoring of the rehabilitated area will be conducted to ensure that the area maintains a sustainable environment. The sumps will be rehabilitated in such a manner to return the area to as close as possible to its pre-drilling environment.
The sumps will be backfilled with subsoils and thereafter topsoil removed from the sump.	
Where necessary, fertilizer will be applied over the area.	
The area will be allowed to seed naturally. Should the revegetation show to be slow, soil analyses will be conducted and the seeding be done in accordance top the results of the analyses.	
Drill site boreholes	
All unused borehole logs will be removed from site and disposed of in an appropriate manner.	Rehabilitation of the drilling site will commence immediately after completion of the drilling. All spills and waste material from the site would have been removed before rehabilitation. Monitoring of the rehabilitated area will be conducted to ensure that the area maintains a sustainable environment.
The borehole plug must be placed at least 0.5 m below surface.	
The borehole will then be covered and levelled with topsoil.	
Where necessary, fertilizer will be applied over the area.	
Post Site Closure	
Activity/Area: Entire Prospecting Right Area (Care, Maintenance and Monitoring)	
Visual inspection of all rehabilitated areas will be conducted (ad hoc inspections will be conducted).	A dedicated manager will be employed for ensuring that the area is inspected and all areas requiring attention will be identified and issues addressed. Post closure, the prospecting area will consist of re-vegetated areas with vegetation cover comparable to the surrounding areas. The area will conform to the pre-prospecting topography. The areas affected by prospecting will be stable and erosion free.
Follow up erosion control and seeding over areas showing erosion gullies and significantly slow revegetation will be conducted.	

6.4 COMPATIBILITY OF THE REHABILITATION PLAN WITH THE CLOSURE OBJECTIVES

The rehabilitation plan was drafted to be compatible with the closure objectives.

6.5 DETERMINATION OF THE QUANTUM OF THE FINANCIAL PROVISION REQUIRED TO MANAGE AND REHABILITATE THE ENVIRONMENT

The financial pecuniary provision for Vleifontein prospecting area will be determined based on the requirements of Chapter 2.4.1 of the Guideline document for the evaluation of the quantum of closure-related financial provision provided by a Mine, revision 1.6, September 2004, DMRE. The financial provision for the first year will be determined and will, with its associated reports be submitted to the competent authority (DMRE).

6.6 METHOD OF PROVIDING FOR THE FINANCIAL PROVISION

According to Regulation 8 of the Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (GNR 1147), an applicant or holder of a right or permit must make financial provision by one or a combination of the following:

- financial guarantee from a bank registered in terms of the Banks Act, 1990 (Act No. 94 of 1990) or from a financial institution registered by the Financial Services Board as an insurer or underwriter;
- deposit into an account administered by the Minister responsible for mineral resources; *or*;
- contribution to a trust fund established in terms of applicable legislation.

Copper Corp (Pty) Limited has opted to use a financial guarantee to provide for the determined quantum for financial provision.

7. MECHANISM FOR MONITORING COMPLIANCE WITH AND PERFOMAMCE ASSESSMENT AGAINST THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND REPORTING THEREOF

7.1 INSPECTIONS AND MONITORING

During the impact assessment, potential impacts on the environment were identified. Mitigation measures were also specified for prevention and management of the impacts so as to minimise their effect on the environment. This section will describe how the mine intends to ensure that the mitigation measures are being undertaken and that their effectiveness is proven.

A monitoring programme has been developed for the identified impacts and their mitigation measures. This monitoring programme will be undertaken and results thereof used to determine the effectiveness of the mitigation measures. The ECO will have an overall responsibility for ensuring that all monitoring is conducted according to the approved EMPr.

7.2 MONITORING COMPLIANCE WITH AND PERFORMANCE ASSESSMENT AGAINST THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND REPORTING THEREOF

As part of the general terms and conditions for a prospecting right, and in order to ensure compliance with the environmental management programme and to assess the continued appropriateness and adequacy of the environmental management programme, Copper Corp (Pty) Limited will:

- Conduct monitoring on a continuous basis (see EMPr)
- Conduct performance assessments of the environmental management programme annually
- Compile and submit a performance assessment report to the minister in which compliance with the approved environmental management programme is demonstrated

The performance assessment report will as a minimum contain the following:

- Information regarding the period applicable to the performance assessment
- The scope of the assessment
- The procedure used for the assessment
- The interpreted information gained from monitoring the approved environmental management programme
- The evaluation criteria used during the assessment
- The results of the assessment

Recommendations on how and when non-compliance and deficiencies will be rectified

7.3 PROCEDURE FOR ENVIRONMENTAL RELATED EMERGENCIES AND REMEDIATION

Copper Corp (Pty) Limited has developed procedures for environmental related emergencies for Vleifontein prospecting area which is explained in more detail below.

Note that these procedures will be revised by the responsible person. The date of commencement of the revised procedures will always be indicated to prevent confusion

7.3.1 Introduction

An effective, comprehensive, well considered and tested environmental emergency preparedness and response plan has the potential to save lives, prevent unnecessary damage to the company and other property and to manage environmental risk. The aim is to identify potential for and respond to accidents and emergency situations, and for preventing and mitigating the environmental impacts that may be associated with them. However, the emergency preparedness and response should be reviewed and revised where necessary.

7.3.2 What is an Environmental Emergency?

An environmental emergency is an unplanned event, which has the potential to result in a significant adverse environmental impact and/or could result in legal liability to Copper Corp (Pty) Limited in terms of environmental legislation requirements. The following define most likely potential environmental emergencies:

- Hydrocarbon spills or leaks
- Surface fires, including veld fires
- A chemical spill
- Transportation accidents
- Other environmental emergencies requiring special services

7.3.3 Purpose of the procedure

To provide guidance to all mine employees and contractors in the event of an environmental emergency at Vleifontein prospecting area and related to its activities.

This procedure is developed so as to provide guidance to ensure that:

Danger to the environment, personnel, contractors and the non-employee is minimised.

- Legal liability is managed and minimised.
- Public relations are effectively managed during and following emergencies.
- Reporting is effective and corrective/follow-up actions are implemented.

7.3.4 Who should use these procedures?

This procedure contains information relevant to all employees and contractors of the mine. It is the responsibility of all employees to familiarise themselves with the contents of this procedure. Furthermore, mine management should ensure that all contractors have access to this procedure and the requirements contained herein (See Table 18).

7.3.5 Responsibilities

Table 18: Responsibilities

Mine Management	Copper Corp (Pty) Limited is responsible for the safety and well-being of employees working at Vleifontein prospecting area as well as the protection of the environment from unnecessary negative impacts. The management of the prospecting area has a responsibility to initiate a warning process should an emergency occur or should something at the prospecting area deteriorate in

	an uncontrolled manner presenting a risk to employees, the public or the environment.
Local Government(s)	Local governments have the responsibility to warn residents of a hazardous situation, these warnings must be based on information provided by the prospecting area.
All employees, contractors and other relevant parties	All employees, contractors and other relevant parties should ensure that they are familiar with this procedure.

7.3.6 Notification process

There are six main steps in managing an emergency, from the identification of the situation to final close off. They are as follows:

- Find and identify
- Ensure human safety
- Reporting
- Containment and clean-up
- Corrective action
- Monitoring

7.3.7 Emergency equipment and supplies

There is a directory of emergency equipment and other supplies on site as well as person/s responsible for the equipment.

7.3.8 Communication systems

Communication is critical during an emergency on site so that efforts to manage the situation are coordinated to produce the desired results. The communication channels that are available on site include:

- Internal phone line system
- Hand held radios
- Cellular phones

7.3.9 Training

The mine management ensures that employees are trained regarding potential emergencies that may occur at Vleifontein prospecting area

7.3.10 Review of procedure

To ensure that the procedure is adequate, management will review the procedure at any time deemed necessary and change the emergency procedures at Vleifontein prospecting area.

7.3.11 Emergency Response flowchart for Copper Corp (Pty) Limited

The emergency response at Vleifontein prospecting area is undertaken, as shown in

Figure 18.

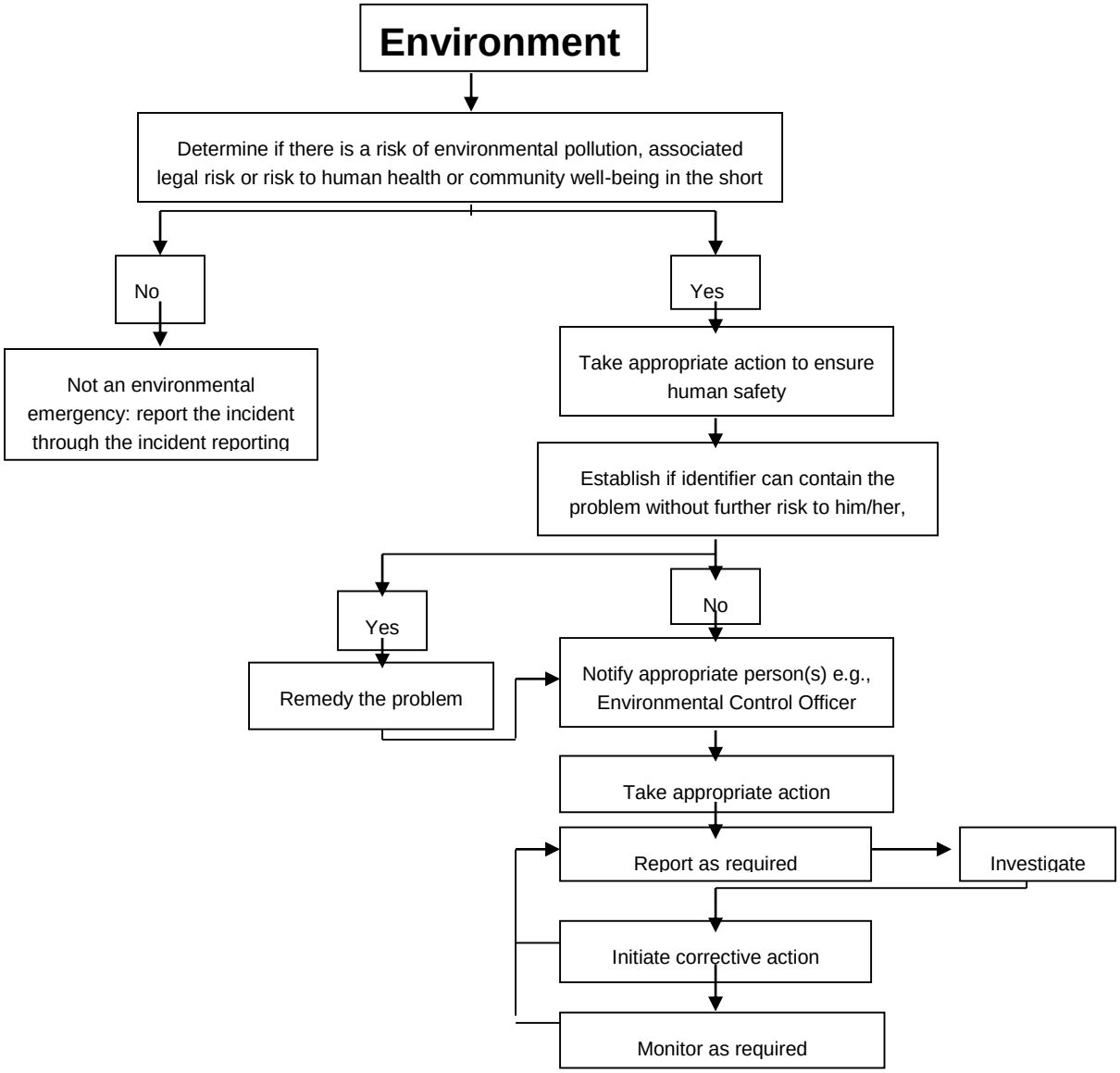


Figure 18: Emergency response.

7.4 ENVIRONMENTAL AWARENESS PLAN

In terms of section 39(3)(c) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), Vleifontein prospecting area must compile and implement an environmental awareness plan. The above-mentioned environmental awareness plan must describe the manner in which the site manager (in this case Vleifontein prospecting area) will inform their employees of any environmental risk which may result from their work and the manner in which the environmental risks will be addressed to avoid pollution or/and degradation of the environment. This document, therefore concerns the details of the environmental awareness plan for Vleifontein prospecting area as required by the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

7.4.1 Objectives and Legal Requirements

The following are the objectives of the environmental awareness plan

- To identify the necessary training needs for different categories of employees in the mine
- To train all employees on environmental issues on the mine

The following legislation apply to this environmental awareness plan

- Employment Equity Act, 1998 (Act 55 of 1998)
- National Environmental Management Act, 1998 (Act 77 of 1998)
- Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

7.4.2 Manner of informing employees of risks to avoid pollution and degradation of the environment

The identification of environmental training and environmental awareness needs are derived from an analysis of the type of role different categories of employees play at Vleifontein prospecting area. The following categories are considered, *viz*:

- Senior Management
- Middle management (Environmental Officers)
- Supervisors
- Operators
- Visitors and contractors

Each of these categories have different responsibilities and therefore have different knowledge requirements and environmental awareness training needs, to obtain that knowledge.
The different categories and environmental awareness and training needs are summarised below in Table 19:

Table 19: Environmental Awareness Matrix.

Occupation Category	EMP Responsibility	Required knowledge and output	Training required	Interval
Senior management	Managing	Understand the EMP objectives	Induction and post-leave awareness/training	Annually
		Knowledge of the prospecting area's significant impacts and risks.	EMP Workshops	Once off
		Review the EMP actions	EMP objectives and actions /Management reviews	Annually
		Knowledge of EMP Procedures (awareness and emergency)	Specific training program on EMP	Once off, refresh annually
Middle and Junior management	Implementing and daily management	Knowledge of prospecting area's significant environmental impacts	EMP Review workshops	Annually
		Setting of EMP objectives for environmental improvement	EMP Review workshops	Annually
		Knowledge of EMP procedures (awareness and emergencies)	Specific training programmes on EMP	Once off, refresh annually
	Adhering to procedures to control impacts	Understand EMP objectives	Induction and post-leave training	Annually
		Knowledge of significant impacts	Induction and post-leave training	Annually
		Knowledge of procedures (awareness and emergency)	EMP Review workshop	Annually
Plant and machine operators, assemblers and elementary occupations	Executing assigned EMP actions Controlling work activities to prevent impacts.	General awareness of EMP impacts and objectives.	Induction and post-leave training	Continuously

Occupation Category	EMP Responsibility	Required knowledge and output	Training required	Interval
		Understand environmental requirements relating to work activities and consequences of not following requirements	Induction and post-leave training	Annually
		Knowledge of procedures	Training and information sharing	Continuously
Visitors and contractor	Managing and controlling daily actions to prevent or control impacts	Basic awareness of EMP	Induction or specific modules/ awareness programme	Once off, annual review if applicable
		Environmental requirements of work activities	Induction or specific awareness programme	Once off, annual review if applicable
		Knowledge of procedures	Training and information sharing	Continuously
		Understanding environmental consequences of personal actions and performance.	Induction or specific modules/ awareness programme	Once off, annual review if applicable
		Compliance to procedures	Induction or specific awareness programmes.	
Personnel requiring specific training and awareness identified on site by management, Environmental Officer, training department, etc.	Managing and controlling daily actions to prevent impacts	Examples include but are not limited to: Waste management Hazardous chemical handling	Specific training programme on EMP procedures.	As required

7.4.3 Induction for all employees, including contractors

All employees (including contractor employees) undergo induction. Vleifontein prospecting area's induction includes training and awareness on environmental issues on the prospecting area and is compulsory for all new employees. The induction programme as mentioned above, have an environmental management component. On an annual basis the environmental section of the induction gets updated. Consideration is given to the following:

- Significant environmental impacts as identified in the EMP
- Procedures: environmental awareness and emergency procedures
- Trends in incidents
- Trends in audit findings

7.4.4 General environmental awareness training

General awareness training is offered to operators, processors and the other various sections of the mine during the safety toolbox talks. This is conducted on rotational basis. New environmental awareness topics are determined and new topics are introduced after all the shifts have received training/awareness on the current topic. The following is undertaken to ensure that the above awareness training is conducted.

- A monthly environmental awareness topic for discussion is distributed to all mine sections. These topics are discussed at the safety toolbox talks, by SHE (Safety, Health and Environmental) representative and environmental officers if available.
- The topics are displayed on the notice boards of all mine sections.
- Ad hoc environmental awareness sessions to various departments/sections are conducted on request. The presentations focus on the environmental issues relevant to individual tasks.

7.4.5 Provision for job specific environmental awareness training

Job specific training is developed to address urgent training needs as identified /required. The training material focus on the following:

- Waste prevention and control (implementation of the waste management procedure).
- Water management (Leaking pipes and taps)
- Hydrocarbon and chemical spill reporting and clean-up
- Storing and handling of chemicals
- Rehabilitation
- Dust management on the mine

Supervisory staff within specific mine sections are equipped with the necessary knowledge and information to guide their employees on environmental aspects applicable in performing a specific task.

7.4.6 Competency training

Management (training official/environmental officer) is responsible for the environmental awareness training of middle management and supervisors. This training is conducted through workshops. If

required, external organisations may be requested to provide training to selected employees (e.g., EMP auditing).

Competence and the effectiveness of training and development initiatives as described in the matrix, are determined through the following:

- Trend analysis and reporting
- Analysis of work areas during visits and audits
- Trend analysis of monthly incidents (or zero tolerance if available) as recorded per mine section.

7.4.7 Review of awareness and training material

The content of all awareness and training material will be updated at least once a year.

7.4.8 Roles and responsibilities

In the case where there is no training department on site, a responsible person should be identified (Mine manager, Environmental Officer or Consultant) to ensure that the objective of this procedure is met.

7.5 UNDERTAKING TO COMPLY

I, ..., the undersigned and duly authorised thereto by **Copper Corp (Pty) Limited** have studied and understand the contents of this document in its entirety and hereby duly undertake to adhere to the conditions as set out therein including the amendment(s) agreed to by the Regional Manager.

Signed at .....……..... this.....day of…….....20.....

..... **.....**

Signature of applicant **Designation**

APPROVAL

Approved in terms of Section 39(4) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)

Signed at…… this.....day of…….....20.....

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REGIONAL MANAGER

REGION:……